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Employee Charged In Program Theft

By Phyllis Higgins

CW West Coast Bureau

OAKLAND, Calif. — Police armed with a search warrant raided a University Computing Co. service bureau in Palo Alto last week, forcing UCC to duplicate all its tapes and punched cards and to dump disk packs and core. Police impounded this data.

A UCC employee was then charged with grand theft. Police said he had tapped Information Systems Design's Oakland computer to steal a proprietary program through unauthorized possession of sections of the ISD security code.

The first indications of the alleged theft were unrelated punched cards appearing in ISD's output during one "tapping" call of a series.

A search of telephone company charges revealed that a call had come from the UCC office. Data line calls between the two offices were then tapped which led to the suspect. Sgt. Terry Green of the Oakland fraud detail said: "The only way to get the information that was stolen was to look for the data. The search warrant was for data cards and any printouts of data banks. Was a stolen property warrant and ISD knew what was missing. We are bending over backwards to keep the impounded tapes private as there is information that companies don't want anyone to see."

Hugh J. Ward, 20, a UCC employee, was charged with grand theft. His lawyer said he would plead innocent. ISD would the allegedly stolen program at \$15,000 to \$25,000. Jerry Hanna, head of the UCC data center in Palo Alto, said that Ward is a "sweet guy, a naive programmer, we are all very upset." He was in customer support.

UCC said it was investigating the facts and Ward has been suspended pending the results.

Richard Hauger, assistant district attorney in Oakland, said: "When we obtained the search warrant we not only had all the tapes and cards duplicated but we found evidence of the competitive program. This is the first theft we know of which is plucking the brains of a computer."

Aiding in the detection were not just the criminal investigators but the department's computer specialist. "It takes an expert to catch an expert," Hauger said.

Both UCC and ISD use Univac 1100s for remote batch processing. The investigation took about one month.

The program, for computerized drawing of graphs, was stolen by calling the ISD computer, giving the proper security code, and calling for a printout, according to Hauger.

(Continued on Page 4)

Military Defends Legality Of Data Banks at Hearings

By Alan Drattell

and Joseph Hanlon

CW Staff Writers

WASHINGTON, D.C. — The Department of Defense told the Senate Subcommittee on Constitutional Rights last week that it had in the past amassed files on prominent civilians, ordinary citizens and various organizations, that it has destroyed some of these files and that a new directive, effective March 1, 1971, provides for the first time a DoD-wide policy on accumulation of data on those outside the military.

Testifying before Sen. Sam J. Ervin's (D-N.C.) hearings on "Computers, Data Banks and the Bill of Rights," Assistant Secretary of Defense Robert F. Froehke told the committee that "maintaining a file is not surveillance," and therefore it was incorrect to say that the American Civil Liberties Union and Sen. Adlai Stevenson III (D-Ill.) had been under surveillance just because Army Intelligence maintained files on them.

J. Fred Buzhardt, general counsel for the Department of Defense, told the hearing that all of the Army's surveillance was legal because there are no laws prohibiting it. Further, he argued that most of the Army's surveillance was legal because people were watched at public meetings.

Surveillance Permitted?

Ervin, a strict constructionist on the Constitution, countered: "I don't see anything in the law that permits" such surveillance.

Surveillance and data banking, he said, deter people from exercising their constitutional rights to speech and assembly, and therefore is illegal.

In defending the Army, Froehke released new information which he said showed that responsible civilians inside and outside the Army knew of the surveillance. Also, he declared there is "no evidence there was any attempt to conceal" the computerization of information.

The March 1, 1971, directive "prohibits," Froehke said, "collecting, reporting, processing or storing information on individuals or organizations not affiliated with the Department of Defense except where essential to the accomplishment of the following DoD mission: protection of DoD functions and property; personnel security; and operations related to civil disturbance."

The directive specifically states

that no computer data banks with information on civilians shall be maintained by the military without specific approval of the secretary of defense or his designee.

The only computer data bank now maintained, according to Froehke, is the Defense Central Index of Investigations.

The index lists 25 million persons who have been investigated, primarily for security clearance, and tells where the full report is filed. The reports themselves are not computerized.

The index also contains references to reports on 750,000 "organizations and incidents," including groups considered subversive. The index is on a 360/40.

Regarding civil disturbance information, Froehke said the data was furnished into a computer, and the use of this tool was a "purely management device."

(Continued on Page 2)

Users Loyal to System Despite B6500 Bugs

By Don Leavitt

CW Staff Writer

DEFECTIVE installations with Burroughs B6500 software have encountered some problems and delays, but most users are not very upset with the situation, which they see as normal development pains that must be expected with any new system.

Even Wellico Data Corp., which recently cancelled its order for Burroughs equipment, put the blame on its own time requirements for development of an on-line trust application, rather than the basic B6500 software itself. Wellico said that it will continue development of the application on IBM 360 equipment, which it already has in-house.

Good Reputation

Although Burroughs has built up a generally favorable reputation over the years in the banking industry, the Wellico cancellation started a number of rumors about wholesale disenchantment with the Burroughs system.

A CW survey covering a third of the current B6500 users shows, instead, a general willingness to stick with the company as it continues its development of the basic software for the new systems.

Complete implementation of the Master Control Program (MCP), or operating system, for the B6500 is running behind original schedule, the company admitted.

One user told CW he accepted his B6500 in December. After six months during which the equipment was pieced together on site. He said that he was still having problems with "some of the niceties" of the software, but conversion was developing smoothly. He brushed off any attempt to define the niceties that were still troublesome, indicating they really were insignificant.

Another user, having admitted

(Continued on Page 4)

Spotlight on User's Lib

Better Technology May Be Bonus

By Frank Piasta

CW Staff Writer

Although most independent peripheral users enjoy the benefits of lower rental costs, they often gain technical features not found in comparable IBM units.

The list of improvements includes disk drives with faster access times and higher track densities, printers with higher read speeds and features not found on the original equipment, and tape transports with mechanisms that move the tape without touching it.

Contrary to popular belief, independent maintenance of the products sometimes surpasses that of the computer manufacturer, according to users.

The memories offered as re-

placements for the IBM 2361 exhibit, perhaps, the widest range of options not available from IBM. Generally, the products of the independents, such as terms that duplicate the random access performance of the 2361, call, have an average access time twice as fast as the IBM 2361. In some cases, the timings achieved are limited only by the cycle time of the CPU.

The equipment of the independents is often more advanced than the IBM units. There is, for example, one plug-in memory from Advanced Memory Systems that duplicates the random access performance of the 2361, but uses solid-state technology. The same company also produces a compromise memory. Also sold state, it uses shift

registers to achieve performance similar to that of a magnetic core array, but with a two-to-one performance advantage over that offered in the 2361.

The more conventional non-IBM memories have patterned core arrays, but with a two-to-one performance advantage over that offered in the 2361.

Smaller Sizes

A recent development is the availability of replacement memory modules in smaller sizes from Fabritek and others. These are to be used in place of the main memory of the smaller 360s, such as the 30, 40 and 50.

(Continued on Page 2)

On the Inside

TI Tape System Price
20% Below IBM 3420
— Page 21

Computer Revenues
In '71 Seen Rising 18%
— Page 29

Communications 22
Computer Industry 29
Editorial 10
Education 23
Finance/Services 33
Software/Peripherals 21

Mayor Hits 'Illegal' Data

WASHINGTON, D.C.—Mayor Joseph L. Alioto of San Francisco told the Ervin subcommittee that confidential information for a 1969 *Look* magazine article alleging that he had connections with organized crime had come illegally from six federal agencies and two California police departments.

Named as sources for the information by Alioto were the Attorney General's office, the Federal Bureau of Investigation, Internal Revenue Service, Bureau of Narcotics and Dangerous Drugs, Bureau of Customs, Immigration and Naturalization Service, California Criminal Identification and Investigation Bureau and the Los Angeles Police Department.

"I have documented an irrefutable case based on evidence that would be inadmissible in a court proceeding of confidential government documents . . . to unauthorized persons in apparent violation of federal statutes . . ." Alioto said.

"Much of the information collected . . . is characteristic of what finds its way into investigative files: that is, it was raw, unverified, unedited, unevaluated, hearsay information," Alioto said.

"The casualness and irresponsibility with which people's names are cast about in intelligence files by informants and by intelligence agencies is appalling."

Alioto further charged that "so widespread is the scope of this illegal disclosure that it permits the reasonable inference that it is being fostered at a level higher than the immediate agents involved in the disclosures."

The mayor submitted most of the documentation for his allegations on the condition that it would not be made public. When the article was published, William B. Arthur, said, "Much of the material was obtained from records of law enforcement agencies."

Army Didn't Try to Conceal Computerization of Information

(Continued from Page 1)

He assured the subcommittee that DoD "is conscious of and responsive to its responsibility with respect to the preservation of personal privacy of those on whom it maintains personnel type data."

To defend against unlawful access to computerized data banks, the DoD official said that the department resorts "to security classification, segregation of data on separate machines and other physical measures." He added that to date there has been no substantial threat of unlawful access.

Bank Destroyed

Froehke said that "as a result of an internal review, the civil disturbance and biographic data bank at Ft. Holabird, Md., was ordered destroyed Feb. 19, 1970, by the Army assistant chief of staff for intelligence."

"On March 20 (1970)," Froehke said, "the Army took action to have copies of civil disturbance publications . . . known as the Compendium destroyed. A certificate of destruction was requested. The destruction of all copies has not yet been assured."

Communists Filed

In earlier testimony, a former military intelligence agent, Sgt. Lawrence F. Lane, reported that it was not just dissident students and radicals who were in the files—one report on the Army's nationwide Teletype network described a protest by railroad commuters in New York.

Lane reported that while he was stationed at Fort Carson, Colo., there was a demonstration outside the gates. Of the 119 participants in the demonstration, 53 of these "were identified gathering personnel or representative of the press." Some intelligence agents came from as far away as the West Coast, and Lane's group followed other agents to see what they were doing.

Lane mentioned another incident in which he was assigned to participate in a rally on a college campus. Some months later, he saw a copy of a report that had been sent to Washington by another agent in which he was mentioned by name as a "dissident serviceman" attending the rally.

Henderson Testimony

In separate testimony, Robert P. Henderson, assistant group vice-president, Honeywell Information Systems, testified that a great deal has been done to provide adequate security measures for computer systems. "Security is not the real problem," he said. "The real problem is in enforcing the security in order to protect the privacy of the files."

"I feel that the phenomenal speed and efficiency of the computer," he said, "has raised the processes of data collection, storage, retrieval and dissemination to the point where it will be easier to invade the privacy of our citizenry. To prevent that, I believe that we must make personal information a property right, with all the attendant guarantees of due process for our laws provide for property."

He urged that business take the necessary steps to protect the data it possesses and he added that "the vendor's chief responsibility is to provide the hardware and software that will enable the user to achieve the degree of security he needs and desires."

In the second week of testimony, Sen. Roman L. Hruska (R-Neb.), a member of the subcommittee, said that he was "disturbed by the imbalance of the testimony" presented the first week of the hearings and the interpretation which has been placed upon it by certain segments of the media.

Hruska said last week that he wished he "had a solution to our

perennial problem of bringing balance to hearings and to the press coverage of them. The need for headlines and the requirements of deadlines insure that charges will be given more publicity than answers . . . I believe an unfortunate and inaccurate impression may have been created which will be difficult to dispel in the minds of many at this point."

The senator said that the civil disorders of the 1960s made it imperative to gather information to provide an early warning system for control of such disorders.

Earlier testimony, Hruska continued, seemed to say that the Army went too far in gathering data. "Most of the criticism we heard has been based on hindsight, an attribute almost everyone seems to have in great quantities. Lack of discretion of those in the field gathering intelligence has been mentioned over and over again . . . they could not distinguish between obviously violent groups and obviously peaceful ones."

"As to this, let me just point out that it has never been the mission of those who gather information to discriminate. The screening must take place later, at the analytical stage."

Hruska added that he would not deny that "some were observed who should not have been," but even in these cases we are talking primarily about public observations, not intrusive intrusions into wholly private lives.

Agrees With Ervin

The senator said he agreed with Ervin that "there must be proper safeguards . . . but in spite of some of the excesses which I personally regret and condemn we will never know how many potential dangers were deterred by the knowledge that surveillance was taking place."

Commenting on Hruska's remarks, Sen. Birch Bayh (D-Ind.), a member of the subcommittee, said that he doubted the Nebraska lawmaker was saying, "if in doubt, spy."

He added that the privacy question "has to be taken out of the political arena," probably referring to Hruska's statement that it was the Johnson Administration which involved the Department of Defense so deeply in domestic intelligence in the first place.

The final day of last week's hearing, Malcolm Moos, president of the University of Minnesota, told the subcommittee: "Legislative action is required to make certain that information is neither collected for improper purposes nor retained for use in ways unrelated to its original legitimate purposes."

A report on political surveillance on the campus was entered into the record.

Computing Center Opened

BELFAST, Ireland—A branch of the National Computing Centre has been opened at the University of Ulster. The centre was set up in 1966 by the Minister of Technology.

Superior Technology May Be Independents' Bonus

(Continued from Page 1)

giving the user an alternate, lower-cost source for memory expansions.

Recent IBM disk drive announcements seem to be trying to catch up with the power being wielded by the independents. The introduction of voice-coil actuator mechanisms by almost all of the independents has been copied by IBM in the new 3330 disk drive system.

The voice-coil has been subjected to a campaign charging that stray electromagnetic impulses from the actuator could prove dangerous to data on nearby disk packs.

Most independents, however, have adopted this method.

Several Advantages

The voice-coil has several advantages over the older hydraulic method. The most obvious of these is speed. Voice-coil-equipped systems have an average access time that is approximately one-half that of the older method.

While it has been argued that this advantage is largely negated by program programming, with the seek time overlapped, the evidence shows up best when the next position of the arm cannot be predicted in advance. This can occur with program retrieval and time-sharing applications.

Cow's Worth Computed

E. LANSING, Mich.—Dairy farmers may refer to computer printout when trying to decide which cows to sell. The information, prepared by Michigan State University scientists, contains the value of a cow, which is computed by multiplying current milk price by the cow's projected production over a year. It also includes feeding recommendations, optimum breeding time, and projected calving time.

Hydraulic system reliability is notably inferior to that of the voice-coil actuators since the older system uses more complex, mechanical parts that are replaced in the newer mechanisms with electronic components.

One 2314-compatible disk drive recently announced by Calcomp, has twice as many data tracks, resulting in a doubling of capacity. A disadvantage of this unit is that it cannot be used in conjunction with a 2314, or equivalent, but this can be offset by the more economical storage provided.

The magnetic tape drive was for some time the area in which the independent was strongest. The use of single captain drives, automatic features such as self-threading, and vacuum column rewind were all initiated by the independents. IBM's latest equipment has had some of these features but the independents had them earlier.

The advanced features on a plug-in plug replacement for the IBM 1403 printer from Telex will indicate the future patterns. This printer can be used off-line as well as on-line. The off-line mode requires an adapter which allows the unit to produce printed copy directly from magnetic tape, without the CPU. Both on-line and off-line operation are possible simultaneously by connecting multiple printers to the controller.

Other new non-IBM features include the universal character set that provides buffering for two user-specified character sets, a buffered format tape that stores the contents of data tape loop in a buffer memory, and an increased print speed that can achieve output rates as high as 2,500 line/min with a 16-character print set.

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Artificial Intelligence—Part III

Public Reaction: 'Unjustified Expectations' or Fear?

By Edward J. Bride

CW Staff Writer

Predictions that thinking machines or "electronic persons" are around the corner contribute to a growing "credibility gap" between the public and researchers in the field of artificial intelligence, according to a Notre Dame philosophy professor.

Dr. Kenneth W. Sayre, director of the university's Institute for the Study of Artificial Intelligence, said the problem is one of "unjustified expectations," not fears, among the general public.

Despite the social implications of the ongoing research into artificial intelligence, scientists seem unified in their desire to analyze the human process of thinking.

They feel that, having acquired this knowledge, man will be able to communicate better, both with other humans and with machines.

They also feel that man would then be able to invent "intelligent assistants," as Thomas G. Evans put it. Evans, chairman of the ACM Special Interest Group on Artificial Intelligence, does not believe that man will be the assistant to a computer. He considers the idea of a computer (or robot) take over a "romantic notion" by science fiction writers or unrealistic people.

While admitting it is "frightening" to ponder a machine taking part in the

continued research will thus result in better programming languages for many other uses, Evans surmised, whether text and general comprehension are achieved or not.

Despite the explanations and reassurances from scientists, there is still an air of mystery surrounding the artificial intelligence.

Dr. Ruth M. Davis, director of the Center for Computer Science and Technology at the National Bureau of Standards, said this mystery gives "more credence than is deserved" to computer science and technology, and to robot theory in general.

The fallout from such study makes it advantageous to try to create a "thinking machine," Dr. Davis claimed. She said this "fallout" included greater technology towards prosthetic sensors, newer high-

level languages, biological modeling for medicine and pattern recognition.

In 1968, Dr. Davis wrote in the *Encyclopedia of Library and Information Science* that the field is "strongly devoid of landmarks."

It is not strictly a matter of size, of "inductive leap or intuitive jump" that seems to evade machines, the late CW recently.

Not all scientists agree that this inductive leap will always be impossible to create, program, build or to avoid.

Dr. Marvin Minsky, one of the leaders in the field, said scientists do not know how to program rules "to guarantee that the machines will work in our interests." He said when the time comes, the scientific community should "postpone rash experiments until we understand this thoroughly."

Evans also emphasized the need for continued testing for "proving program performance," since the greater dangers, if there are any, lie in faulty programming, in a machine's not doing its instructed tasks... or the tasks the human programmers think they have written.

Opponents of the field are generally more melodramatic in expressing their fears or reservations. An article on brain research in the former IBM magazine *Think*, while not dealing directly with artificial intelligence, concluded with remarks that are typical of the antagonists. The article first quoted an English neuro-researcher, and concluded:

"Who will first explain and cure paranoia will have the means of producing it. Man, it is hoped, will have grown enough in wisdom by then to make the right choice."

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Lot Android Do It

ODENWALD, West Germany—Despite reassurances from scientists that independent robots would be impractical to build, even if programming technology had progressed to the stage where machine thought were possible, word comes from here of an "artificial man" being born.

The final product is still on the drawing board but a 33-year-old scientist is reported to have solved the thought problem by developing a "brain" that will function like a human's. The actual mechanics and the source of energy remain to be solved.

The scientist calls his creation Android (resembling man), and reportedly has some of them already working in his shop. Reports said that he projected a four-year period to put the first true robots in operation, except for the problem of a portable energy supply.

thought process, Evans said constructing models of thought could aid in the very teaching of thinking, in teaching communicating, and in the understanding of the human intellect.

He said the recent trend in artificial intelligence was to program machines to become "experts" in one particular area, rather than to become general problem-solvers.

Pattern recognition and process control systems would be two such areas, while identifiable offsprings of this research include data management systems and the List Processing (Lisp) techniques for building models.

There are no "intrinsic limitations" to the field, he claimed, although the day man has to determine "who's in charge" is not at hand.

Closer at hand are advances in fault-tolerant computing, and in diagnostic and debugging techniques, Evans related. Also interesting are the chances of text comprehension, not in natural language so much, but in general knowledge.

All these possibilities contribute to the growing problem of getting the public to accept "comprehending machines," Evans indicated. But, as others have observed, a program for text comprehension would indeed be huge, and no successful ones have been written yet.

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St. Louis Mail Sorting Takes Giant Step, 333,000 Pieces a Day May Be Possible

CW Midwest Bureau

ST. LOUIS, Mo. — An experienced mail clerk, the post office says, can sort 750 pieces of mail in an hour. A trained operator of a letter sorting machine can sort 1,450 pieces an hour, according to the post office. But a computer and a scanner can sort 16,000 pieces in an hour, and the St. Louis Post Office is proving it.

Sixteen thousand pieces of mail an hour is close to 200,000 pieces in a work day, and post office officials said they hope to get that total up to 333,000 per work day when the operators of a computerized mail sorting machine are familiar with their equipment.

The equipment, the combination of a Philco Ford OCR machine and a Burroughs computer, scans printed or typed envelopes and distributes them to what the post office calls destination bins.

Two eyes of the OCR device read the full address on the envelope and input that data to the computer. The computer activates a mechanical

arm that sends that envelope to the correct destination bin, one of 305.

Postal Zones

The bins correspond to postal zones, both local and out of city. While a given bag of St. Louis mail may contain addresses all over the country, the State of Missouri and metropolitan St. Louis, the computerized scanner slips the mail into the correct bin with what a St. Louis postal worker calls "fantastic" accuracy.

The St. Louis Post Office handles about five million pieces of mail per day. Two million of this is business mail, envelopes with typed or printed addresses. A post office spokesman said the St. Louis post office carried on a campaign in business areas to instruct how to bundle this type of mail.

Now, after some small success in obtaining the businessman's cooperation, sacks of mail can be delivered directly to the computer/scanner operation.

Computerized Study Of Football Decisions Reveals New Myths

CW Midwest Bureau

CINCINNATI — Virgil Carter, as a quarterback for the National Football League's Bengals here, makes a lot of decisions on a football field. But Carter cheats a little; he uses a computer.

Carter, holder of a Masters Degree in business administration from Northwestern University and a teacher at Xavier University in Cincinnati, coauthored a technical paper entitled "Operations Research on Football" with one of his Northwestern professors.

First Phase

The report is the first phase of a study on football and covers some 20,000 plays in 56 games of the first half of the NFL 1969 season. Judy Carter, the quarterback's wife, coded the plays over a year's time, and Carter programmed them for analysis.

The analysis uncovered some facts that made myths out of the old truths. Calling time out to stop the clock proved to be mathematically incorrect and illogical. A field goal attempt on fourth down is about 98% effective for a well-centered ball (in relation to the goal posts) and with a kicker with a good attained record, but could drop to as low as 6% if all the indicators aren't there.

Bruins May Keep Cup If Foster Has His Way

BOSTON — Hockey's world champion Boston Bruins are beginning to look like sure repeaters for the Stanley Cup this year, but Foster could have told you that weeks ago.

Foster is a Honeywell H1250 computer, programmed by hockey fans at a Honeywell district office in Scarborough, Ontario, a company publication Feb. 1 reported the three fans and a statistician from the National Hockey League had completed the project around midseason, when the Bruins were already solidly in first place in the Eastern Division.

Foster predicted Montreal would take second place from New York in the East, followed by Detroit and Toronto.

In the Western Division, the program predicted the first four teams would be Chicago, Minnesota, St. Louis and Philadelphia.

Fans and sports writers in Boston are predicting Chicago and the Bruins as finalists in the Stanley Cup Tournament, and Foster came up with the same prediction, with Boston emerging the victor.



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DP Centers Find New Fire Extinguishing Agent System

By Edward J. Bride

WILMINGTON, Del.—Are sprinklers obsolete in computer installations? Is carbon dioxide replaceable?

A growing number of computer users apparently think so, as Halon 1301 is becoming a popular fire extinguishing agent. The National Fire Protection Association (NFPA) issued its first standard for use of "halogenated extinguishing agent systems" last year, paving the way for increased use and acceptance of

the product.

Initially developed by Dupont's Freon Products Division here, the product carries the trade name "Freon 1301" in company literature. The dozen or so manufacturers of fire-fighting equipment which use the chemical refer to it as "halon" or "Halon 1301." Dupont is the only supplier of the chemical itself.

Chief advantages of the halon vapor are low toxicity and fast effectiveness, which point to the fact that personnel need not be

evacuated during a fire while halon systems are in use.

Most computer installations using this chemical have "total flooding systems," according to Fenwal Inc., of Ashland, Mass., Dupont's largest customer for halon.

Fenwal currently has over 100 halon systems in use by companies with sophisticated electronic gear, and over half of these are DP centers, company officials stated.

A "local application" system is used in tape storage modules of the library control unit recently introduced by Advanced Digital Systems. In this system, as in larger installations, high-speed detectors and a fast rate of discharge combine to extinguish a fire automatically.

Detectors include ultraviolet smoke detectors, thermal switches and temperature-increase devices which cause release of the extinguishant after first sounding an alarm. A control panel can permit manual interruption of the automatic system through a built-in time delay which can be set from 15 seconds to one minute, depending on the user's needs.

The NFPA standard notes halon systems are useful "where an electrically nonconductive medium is essential or desirable, where cleanup of other media presents a problem, or where weight vs. extinguishing potential is a factor."

Included as the more important hazards which may "satisfactorily" be protected by halon

are electrical hazards such as transformers, oil switches and circuit breakers, rotating equipment and ordinary combustibles such as paper, wood and textiles.

Halon should not be used to extinguish fires involving chemicals with their own oxygen supply, reactive metals (sodium, potassium and a few others), or metal hydrides. The chemical is considered effective in fighting all three classes of fires, and Underwriters Laboratories lists its toxicity in Class B (least toxic).

"Use a cheaper agent, when you can," mentioned Alf M. Fritsvold, New England regional manager of Fenwal's Protection Systems Division. The importance in deciding on the agent lies in the need to keep the space manned and operating continually, Fritsvold said.

Thus, while CO₂ might be cheaper, personnel must be evacuated when it is used. And, while water is cheapest of all, corrosion or electrical damage could present more danger than the fire itself, Fritsvold continued.

U.S. Awards Pact To Study Pay

CW Washington Bureau
WASHINGTON, D.C.—The Federal Reserve has awarded a \$214,750 contract to the systems application center of TRW Inc., Redondo Beach, Calif., to develop a computer model that will simulate the nation's payments mechanism.

The model will portray the flows of checks and other cash items within and among the cities where the Federal Reserve maintains offices.

Primary purposes of the model will be to determine the future potential of the existing check collection network and to evaluate possible alternatives to the present system.

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This DP Plan Failed to Register

CW Midwest Bureau

MADISON, Wis. — While others bickered over who or what was at fault, a chancellor of the University of Wisconsin here settled a registration matter by blaming a computer.

Vice-Chancellor Irving Shain announced that the university will abandon its computerized preregistration program adopted last year to assign students to multisectioned courses.

Shain said that there were more than 30,000 course "adds" and "drops" by students dissatisfied with the section selected for them by the computer. "Anytime," he added, "that you schedule a student without his participation in the process you're in for trouble."

Many of the students claimed that they were unable to take the courses they wanted. University officials blamed the problem on the Teaching Assistants Association Union contract's (class) manning provisions, and the union blamed it all on professors, claiming that the professors were not teaching enough and, thereby, increasing the workload of the teaching assistants.

A student said: "When you request a class by a certain teacher and some stupid computer ignores you, you don't have to put up with that."

Computerized Car Pools May Catch On When Motorists Know of Possibilities

CW West Coast Bureau

LOS ANGELES — The use of computers as matchmakers not for dates or marriage but for auto passengers headed for the same destination is mushrooming around the country.

The purpose is to get more cars off the roads to cut down on pollution, open up clogged roads for easier driving and to provide the convenience of shared driving. The most ambitious program was proposed in a letter to the *Los Angeles Times* by Sanford Shapiro and Frank Skoclich of Canoga Park, Calif.

They would computerize carpooling on a statewide basis with voluntary questionnaires sent to all, which would ask for the respondent's Social Security

number and information about daily transportation route. This information would then be digested by a central computer which would come up with "matches."

As an incentive they propose a one cent per mile per passenger tax deduction for each driver. This would mean a \$300 tax deduction on both state and federal returns for each driver if there were four in the pool and they logged 10,000 miles a year.

Computerized car pools have been started in Philadelphia, New York, Berkeley, Calif., and Plainview, L.I. One was also started in Los Angeles but there were not enough respondents to make the pool work. This same problem is slowing down the usefulness of the plan in most areas, but where the media is used for promotion, however, the results are significant.

Last spring, station KGO in San Francisco campaigned for

"car pool day — April 16." On that day the Golden Gate Bridge traffic was down from an average load of 17,200 cars to 1,000 fewer and the air pollution control district reported a 2.3 ton drop in pollution.

J. Ralph Richards of Berkeley was one of the instigators of the experiment. He has been operating the Common Sense Computerized Commuter Car Pools for more than three years. He admits that he doesn't use a computer for the matching but said it is a "go" word. He has had 700 subscribers.

In Plainview, L.I., a teletype-writer is used in the home of Lloyd R. Kimball for his time-shared computer service. It is still under-subscribed but was brought to the attention of the Long Island Planning Board. Some members felt it might take people off the Long Island Railroad and put them on the expressways.

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Editorial

Not Enough

Sen. Roman L. Hruska (R-Nebr.) said at the data bank hearing that we should concentrate on making data bank information "useful, necessary, dependable and complete . . . and . . . separate that which is harmful . . ."

This is an oversimplification.

Information that is "useful, necessary, dependable and complete" when filled for Purpose A may become useless, unnecessary, undependable, and/or incomplete when retrieved for Purpose B.

In other words, adequate control of input is less important than adequate control of output.

Computers can help in many ways. They can automatically purge records that have outlived their usefulness (based on date). They can refuse to answer unauthorized questions. They can, however, answer in perpetuity, or permanently, what retrieved what information. They can automatically notify the subject of a search of the identity of the searcher and detail what data was retrieved.

But they will do none of these things unless the people who perform them are held personally responsible for their performance.

The performance of banks (the money kind) is closely monitored and regulated. And they're only handling money.

A person's reputation is a more valuable asset than his money. Its handling should be controlled at least as carefully.

Letters to the Editor

Univac I: Some Doubts

In the Feb. 10 issue, Richard M. Petersen finds particular significance in the use by Univac I of an off-line printing approach as opposed to what he calls the "follow the leader" integral printing approach used by IBM. It may be important to remember that the very short mean time to failure of the Univac I probably left the design engineers with no acceptable alternative to off-line printing. If such were the case, it serves no useful purpose to imply that their choice of off-line printing demonstrated a special insight into computer systems architecture.

Nor can IBM be credited with a "remarkably clear vision" of the future of computers. Only the peculiarities of the IBM organizational approach which tolerates and even encourages bootlegged and even conflicting products allowed computers to develop as a major product line.

Sigmund Silber
Management Consultant
New York, N.Y.

Univac I veterans dispute your statement that Univac I had a short mean time to failure and tell us that the off-line printing system was designed to save precious CPU time. Ed.

Clitches, Gimmicks. Turn Ervin Hearings Into 3-Ring Expose on Data Banks

WASHINGTON, D.C. — Playing to a bank of television cameras and to tables packed with press representatives plus an audience

D.C. Dots-Line
By
Alan Drattell



of about 100 on-lookers, the 1971 privacy probe got under way in room 318 of the old Senate office building here recently.

The theatrical affair is scheduled to close March 11 after a three-day run of hearings concerning computers, data banks and the Bill of Rights.

The atmosphere of the hearings — somewhat akin to opening night on Broadway — was not typical of congressional investigations. What was really needed was some sensible discussion of the privacy problem and how it can best be solved. But, instead, we saw some of the participants attempting to steal the show, tossing out headline-grabbing jargon and coming up with gimmicks contrived to snare the attention of the cameras and the working press.

The hearings were staged by the Senate Subcommittee on Constitutional Rights, and Sen. Sam J. Ervin, Jr. (D-N.C.) got right into the spirit of things when he lifted a hefty family Bible which he proclaimed weighed 11 pounds. "Contrast it with this piece of microfilm," he said, holding up a 2 in. by 2 in. square which he explained "contains on it 1,245 pages of a Bible, with all 773,746 words of it. This means a reduction of 62,500 to one."

The first witness, Arthur R. Miller, professor of law at the University of Michigan, followed Ervin's act with a chant containing the classic clichés attributable to the computer community.

He talked about the "elec-

tronic behemoths" threatening individual privacy and he discussed what has by now become the watchword of the computer generation, "GIGO," or "garbage in, garbage out."

And then he intoned that "we are in 1984 minus 13 . . . and counting."

The visions of the computer monsters and their keepers — the programmers and systems analysts — were not lost on the press.

The *Washington Evening Star's* account of the first day's sessions was headlined, "Snooping Probe Opens: '1984' Specter Raised at Hearing."

The *Washington Post's* story included a scene where Ervin waved a 53-page personality as-

part of the formal record of the proceedings.

The overall purpose of the subcommittee's hearings is to learn what government data banks have been developed; how far they are already computerized; what constitutional rights, if any, are affected by them; and what overall legislative controls, if any, are required.

These purposes are noble ones, and it has become obvious the past few years that some type of regulatory controls is necessary to protect the privacy of individual citizens.

Many federal agencies, as Ervin said in his opening remarks to the hearings, have started data gathering activities with a worthy purpose but have gone

'Circus Atmosphere' Defended

By Joseph Hanlon

CW Staff Writer

Publicity is the only weapon we have now against the abuses of computer data banks. Even feeble attempts to control invasions of privacy have bogged down in a disinterested Congress, and it will be a year at best before we can expect any new legislation.

Without controls, data banks have expanded unchecked, and threaten us all. Most of the data banks have grown unknown to the general public. Publicity, often in the form of scare headlines, has informed many people for the first time about this threat. Publicity has also been instrumental in curbing the worst abuses, such as the Army's surveillance of lawful political protests.

There is as yet no simple set of laws that will control data banks — broad outlines are now clear, but the details require considerable discussion. Publicity will get more people involved in the discussion, keep the issue in the public eye, and mobilize support for legislation. In his column on this page, Alan Drattell criticizes the Ervin hearings for the circus atmosphere. But this circus atmosphere has kept the hearings on front pages throughout the country, and has probably done more than any other single thing to make people aware of the problem. A circus atmosphere is a small price to pay for that awareness.

More important, Drattell has missed the point that what may seem clichés to those in our industry — and are hardly clichés to the general public or the senators. As for Prof. Miller, his talk about "electronic behemoths" was only too valid.

His knowledge of computers is quite good, and he is probably the ranking expert in the field of privacy law.

assessment questionnaire for federal employees including questions concerning how an individual crosses his legs, his feeling toward prostitutes and who dominates at home.

The *Chicago Tribune* picked up this account, too, but put the query about prostitutes in the lead paragraph.

Some sanity was brought to the hearing, however, by Sen. Roman L. Hruska, the ranking Republican on the subcommittee, who was disturbed by Miller's contention that federal agencies, and the FBI in particular, were blatantly guilty of snooping on private individuals.

He suggested to the professor that it would be more useful if he would stop "ridiculing" and instead devote efforts to showing how "we can make information gathered useful, necessary, dependable and complete . . . and how we can separate that which is harmful and set up some means of control."

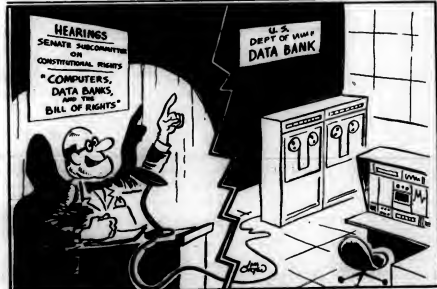
Miller's testimony did include some concrete suggestions, but unfortunately most of the information was never presented verbally to the subcommittee. Instead, it was contained in a printed statement that was made

so far beyond what was needed in the way of information "that the individual's privacy and right to due process of law are threatened by the very existence of files."

Unfortunately, the public gets a three-ring exposure to the privacy problem when clichés and gimmicks grab the spotlight. They are scared by the politician and by some of the hearing participants — some of whom may themselves have little understanding of the computer revolution itself.

Their fears are enhanced by many in the media who also have little knowledge of computers and what they can and, more importantly, cannot do. We need rational discussion of the privacy problem in a committee hearing room, in the computer press and in the general media.

And to aid in this discussion, we also need a crash program sponsored by the DP community to educate the public. The computer industry for too long has been content to babble to itself, reasoning illogically that it had no need to discourse with the uninitiated. Our parochialism has now come home to roost.



"...Absolutely No Threat Whatever to Personal Liberty..."

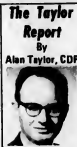
Input Editing or Output Blocking?

Why Doesn't Neil Sutter Know His Math Grades?

Next only to the computer systems that deal with the credit cards, and retail billing, the computer systems that affect more of the U.S. population than others are those that handle school reporting.

They affect practically all of our youths (dropouts are, of course, excepted) and their parents directly.

They affect school finances, indirectly, and all that that implies. Here, if anywhere, we should then find good system design. Do we?



The Taylor Report
By Alan Taylor, CDP

So, what is the type of program which is able both to be operated, and to check the input code validity? We need to know that before we can see whether or not Sutter's suggested standard is a good one.

• **Output Needs Control**

Clearly the problem lies in the output. Given that the total input is not compatible with the program the first question to decide is whether or not any output should be directed to Sutter. My opinion is that it should be.

Some of the output is valid, but even if it were not, then he should be told that there is a problem. (I would suggest in these cases the following outputs on the program—see Figures 2 and 3.)

In a wider point, however, there may be problems with this approach. There may be cases where although the input is partially right, it is sufficiently wrong that you want to stop the whole form. This demands considering the output of the form, rather than the line of the form, as a unit.

Now it comes down to what programming you are using. If you are using the type of programming which you write like to do it in many cases. (You could, in Sutter's case, simply by changing the address to that of the senior systems analyst of the University of Arizona's own DP operations; but that is a quick of forms design.)

In cases where the address is at the top of the form it will already have been printed so you cannot use that way. Really there is no way out for line-based output except to hold everything in a buffer and not so much to check the validity of the input at Sutter suggests, but, instead, to check the validity of the actual output—the whole form—before letting it be created.

I think Sutter's point suggesting a standard is excellent—but it puts the responsibility on the wrong shoulders. I would like to suggest that we also adopt another standard, which is to

happen would be that Sutter would simply be sent a report which pretended that he was not even at the course!

It is most probable that on the output tape, or on the printer itself, the first three lines have already been printed. Of course, it would be possible for the program just to stop processing and get the operator to ring up the instructor—but that is not very good computer practice either.

So, what is the type of program which is able both to be operated, and to check the input code validity? We need to know that before we can see whether or not Sutter's suggested standard is a good one.

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DESCRIPTION	DEPT.	COURSE	SECT	UNITS	GRADE	REG.	TOTAL	SUTTER	SEN.
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11. INCOMPLETE	12. INCOMPLETE	13. INCOMPLETE	14. INCOMPLETE	15. INCOMPLETE	16. INCOMPLETE	17. INCOMPLETE	18. INCOMPLETE	19. INCOMPLETE	20. INCOMPLETE
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41. REVERSE SIDE FOR COLLEGE	42. REVERSE SIDE FOR COLLEGE	43. REVERSE SIDE FOR COLLEGE	44. REVERSE SIDE FOR COLLEGE	45. REVERSE SIDE FOR COLLEGE	46. REVERSE SIDE FOR COLLEGE	47. REVERSE SIDE FOR COLLEGE	48. REVERSE SIDE FOR COLLEGE	49. REVERSE SIDE FOR COLLEGE	50. REVERSE SIDE FOR COLLEGE

Figure 1. The original report as produced on the computer and mailed to Sutter. Note that his grade is shown as Y, although no such grade is listed in the grade codes. (The report has been reset from a copy, for clarity of reproduction.)

SUTTER NEIL GRAHAM									
STUDENT ID.	13	0	9	7	0	1	1	0000	3
DESCRIPTION	DEPT.	COURSE	SECT	UNITS	GRADE	REG.	TOTAL	SUTTER	SEN.
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11. INCOMPLETE	12. INCOMPLETE	13. INCOMPLETE	14. INCOMPLETE	15. INCOMPLETE	16. INCOMPLETE	17. INCOMPLETE	18. INCOMPLETE	19. INCOMPLETE	20. INCOMPLETE
21. REGISTRATION CANCELLED	22. REGISTRATION CANCELLED	23. REGISTRATION CANCELLED	24. REGISTRATION CANCELLED	25. REGISTRATION CANCELLED	26. REGISTRATION CANCELLED	27. REGISTRATION CANCELLED	28. REGISTRATION CANCELLED	29. REGISTRATION CANCELLED	30. REGISTRATION CANCELLED
31. GRADUATION AVERAGE	32. GRADUATION AVERAGE	33. GRADUATION AVERAGE	34. GRADUATION AVERAGE	35. GRADUATION AVERAGE	36. GRADUATION AVERAGE	37. GRADUATION AVERAGE	38. GRADUATION AVERAGE	39. GRADUATION AVERAGE	40. GRADUATION AVERAGE
41. REVERSE SIDE FOR COLLEGE	42. REVERSE SIDE FOR COLLEGE	43. REVERSE SIDE FOR COLLEGE	44. REVERSE SIDE FOR COLLEGE	45. REVERSE SIDE FOR COLLEGE	46. REVERSE SIDE FOR COLLEGE	47. REVERSE SIDE FOR COLLEGE	48. REVERSE SIDE FOR COLLEGE	49. REVERSE SIDE FOR COLLEGE	50. REVERSE SIDE FOR COLLEGE

Figure 2. The report as it might have been produced if the computer program had checked for valid input of grades. Note that the data preceding the invalid input line has not been changed, and that Sutter is notified of all available information, and that a report error does exist. However, his files at the university may now be wrong.

SUTTER NEIL GRAHAM									
STUDENT ID.	13	0	9	7	0	1	1	0000	3
DESCRIPTION	DEPT.	COURSE	SECT	UNITS	GRADE	REG.	TOTAL	SUTTER	SEN.
INTRO DIGIT SYST	ELE	371		3	Y	1			
GRADE CODE									
1. SUPERIOR	2. ABOVE AVERAGE	3. COURSE CANCELLED	4. AVERAGE	5. NO CREDIT	6. NO ENTRY	7. TEMPORARY AVERAGE	8. FAILURE	9. FAILURE	10. FAILURE
11. INCOMPLETE	12. INCOMPLETE	13. INCOMPLETE	14. INCOMPLETE	15. INCOMPLETE	16. INCOMPLETE	17. INCOMPLETE	18. INCOMPLETE	19. INCOMPLETE	20. INCOMPLETE
21. REGISTRATION CANCELLED	22. REGISTRATION CANCELLED	23. REGISTRATION CANCELLED	24. REGISTRATION CANCELLED	25. REGISTRATION CANCELLED	26. REGISTRATION CANCELLED	27. REGISTRATION CANCELLED	28. REGISTRATION CANCELLED	29. REGISTRATION CANCELLED	30. REGISTRATION CANCELLED
31. GRADUATION AVERAGE	32. GRADUATION AVERAGE	33. GRADUATION AVERAGE	34. GRADUATION AVERAGE	35. GRADUATION AVERAGE	36. GRADUATION AVERAGE	37. GRADUATION AVERAGE	38. GRADUATION AVERAGE	39. GRADUATION AVERAGE	40. GRADUATION AVERAGE
41. REVERSE SIDE FOR COLLEGE	42. REVERSE SIDE FOR COLLEGE	43. REVERSE SIDE FOR COLLEGE	44. REVERSE SIDE FOR COLLEGE	45. REVERSE SIDE FOR COLLEGE	46. REVERSE SIDE FOR COLLEGE	47. REVERSE SIDE FOR COLLEGE	48. REVERSE SIDE FOR COLLEGE	49. REVERSE SIDE FOR COLLEGE	50. REVERSE SIDE FOR COLLEGE

Figure 3. Report as it might have been produced if the fact that there was a problem had been noted before any printing took place. Now the proper emphasis can be given, and the proper address used.

check the validity of the output before creating a form for general consumption.

Does anyone question that?

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Output Already Produced

Look again at the output. It consists of three lines before they come to the Mathematical Topics report line, and three lines after it. Now let us consider what would happen if on reading the descriptive title and finding that we have grade Y, the computer program proceeds to reject it.

I do not know the program, of course—but I have a horrible idea that what would probably

save 30% on 370 leases!

Write: CW Box 3344

60 Austin St., Newton, Mass. 02160

Cooperative Sets Out to Save the Trees

By Edward J. Bride

CW Staff Writer

SOMERVILLE, Mass. — 1,224 trees! The nonprofit Recycling Revolution Cooperative (RRC) claims to have saved that many trees by recycling over 70 tons of computer output.

The waste was comprised of 93,203 pounds of printout paper and 51,738 pounds of tab cards, as of the end of January.

Formed last fall [CW, Oct. 21], the cooperative rents trucks and picks up computer waste twice a week. Its biggest "customers" are listed as MIT, with two tons of paper waste a week, and PHI Computer Services, one ton a week.

Tree-Savers

Also listed as major tree-savers are Harvard University and Honeywell, both providing about 1,500 pounds a week. The growing list of concerned computer users includes colleges, hospitals, service bu-

reaus and other businesses. The group said it may add a third collection day, if volume continues to grow.

Sincere about their calling, RRC members have joined other environmental groups in a fundraising campaign to purchase a truck. Expenses for truck rentals over the last five months have averaged over \$45 a week, according to the RRC's newsletter, "Earthworm News."

Other groups in this effort are Boston Environment (glass) and Greater Boston Ecology Action (food cooperatives and other projects.)

RRC grew from this latter collaboration last summer, after a realization that computer paper is high quality paper for which there was a good recycling market. Commercial recycling firms are reluctant to deal with any but the largest "suppliers" of waste paper, since a low profit margin demands high volume. With the profit motive absent, RRC strives only to "break even" after truck expenses, which

include compensation for the heavy work.

The group's members, working out of a residence at 14 Park Ave. here, offer to set up recycling programs for businesses. A member noted it is the "conscientiousness of the programmers and other users" that increases the amount of paper recycled.

Striving for ways to "increase the impact" of recycling on the public conscience, "Earthworm News" promised to discuss pending legislation dealing with reclamation and reuse of solid wastes, including listing dates and times of hearings.

Examples of the paper problem and possible solutions were given in the first newsletter last month, wherein RRC suggested readers should "try to get your local newspaper to use recycled newsprint only."

The letter also noted 50% of the waste in the "typical dump" is paper.



Eye-Deal!

Although they may not know it, turtles with eye irritations have a computer in Miami looking out for their best interests. Paterson Pet Supply, a pet product wholesaler, is using an IBM System/3 Model 10 to help maintain an adequate inventory of over 4,000 different items.

Tape Recertification Vital to Nasa Savings

KENNEDY SPACE CENTER, Fla. — Every year enough instrumentation and computer tape to span the globe more than one and one-half times (some 39,000 miles of tape) is cleaned, processed and recertified at the Kennedy Space Center.

These tasks are performed here for the National Aeronautics and Space Administration by International Telephone and Telegraph Corp.'s service associate, Federal Electric Corp. of Paramus, N.J.

"This work is vital to Nasa's cost-savings program," says Robert C. Pittman of North Caldwell, N.J., Federal Electric president. "If the tapes weren't cleaned, processed and recertified, it would be necessary to purchase thousands of new tapes to replace each one whose performance was questioned in any way."

A tape can be used about five times before recertification is necessary.

Over any period of time, 60% of the instrumentation tape can be saved, processed and recertified. Of the less critical digital tape used in data processing, 95% can be returned for reuse after proper processing.

During a recent six-month period, 5,059 reels of instrumentation tape were saved for reuse by recertification. At the same time, 18,740 computer tapes were saved.

A 12-month projection shows that the tape certification laboratory will put 12,000 reels of instrumentation tape back into use, and 40,000 of digital.

To Test or Not to...? That is the Question

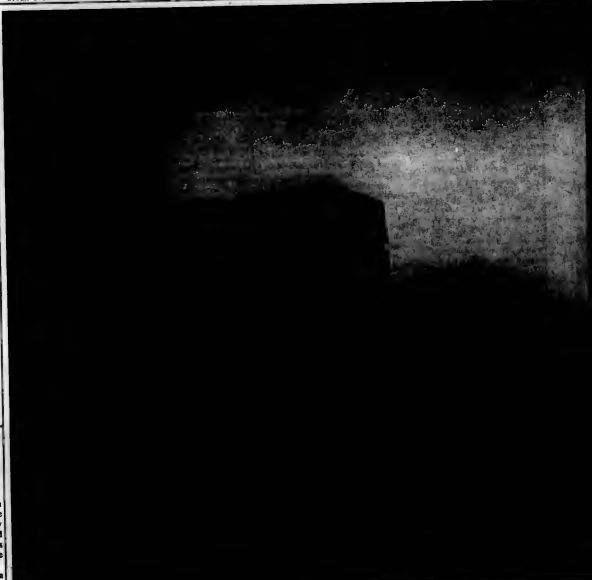
CW Midwest Bureau

LORAIN, Ohio — A service bureau from nearby Elyria wants to get paid for three programs it delivered to Lorain County last December, but the county board won't pay for them until the programs are tested, and some lawyers and some politicians are getting upset.

"I don't know what it is about data processing," said Lorain County legal adviser Richard Laux, "but you can't get straight answers from anyone."

On Dec. 30, Data Development and Research, Inc. of Elyria delivered an accounts receivable program, a financial report program, an accounts payable program and a bill for \$21,500 to the DP board of Lorain County. Now the firm, and its head, William Gladish, want to be paid.

Laux said he could not approve payment of the Data Development bill until some questions he had were answered. He did not specify as to what those questions were.



Model CDS 114

At the Fall Joint Computer Conference in 1969, Century Data Systems went one-up on the industry with the introduction of the CDS 114, the fastest, most reliable, most efficient and lowest priced disk drive on the market.

2d Proposed ACM Amendment Hinges on Ethics Code

By Edward J. Bride
CW Staff Writer

NEW YORK—Lack of integrity or "other reasonable cause" could bring expulsion from the Association for Computing Machinery, under one of two proposed amendments to the ACM Constitution.

The second change would remove the chairman of the editorial board from the list of officers, relegate him to a council member, and change his board's title to "publications."

Members of the society are currently considering the changes, which were recommended by the ACM Council last fall. Ballots are due at headquarters here March 12.

A proposed addition to the constitution would require the council to "adopt, maintain, enforce and conspicuously publish and display" to all members, and the public, a code of professional ethics.

A suggestion that this be a "code of

ethics and competence" was defeated at the November council meeting, leaving the door open to eventual discussion and evolution of standards for competence even if the amendments are defeated, one member reported.

Under the proposed amendment to Article 3 ("membership"), a person "may be admonished, suspended or expelled for demonstrating lack of integrity, or for other reasonable cause, after a hearing of the case before the council," and with a three-fourths vote for the appropriate censure.

Currently, a member may be censured for nonpayment of dues (that proposal remains), or for reasonable cause.

The "integrity" clause represents an expansion of ACM's purposes, as delineated in a concurrent proposal to change Article 2 ("purpose"). "To develop and maintain the integrity and competence of individuals engaged in the practices of the sciences and arts of

information processing..."

In its present form, the purpose is only "to develop the skills."

Ethics up to individual?

An ACM "distillation" of arguments against the enforcement of any code of ethics surmised "ethical behavior is an individual matter" and enforcement would be expensive and difficult.

Arguments for this amendment included a claim that, if ACM does not take the responsibility of defining and enforcing ethics, then "it might be done by government, in which case the computing professionals would have very little, if any, say in the regulations which might be imposed."

Another argument, not discussed in ACM literature but suggested by an opponent of the measure, claimed there were no procedural guarantees for a member accused of unethical behavior. The opponent said such an accused

person should have three basic rights: to know the charges, confront his accusers and be present at the hearing.

Council member Dr. Herbert R.J. Grosch said the proposal was written with the "intention" that an accused person could be present if he so chose, but he could also choose to send a statement, or be represented by a friend, lawyer or associate.

The present form of Article 3 does not deal with procedures, either, and Grosch said an executive committee "should set the proper steps for the hearings, including rights of the accused."

Professional or Political?

There was also some confusion among some ACM members regarding the code of ethics, and as to whether "professional ethics" were the intended subject of the "lack of integrity" clause. One opponent reminded CW that draft, evasion, marijuana possession and other controversial "political-type" offenses are considered felonies in some states, and might qualify under "reasonable cause" for expulsion, if the amendment weren't clarified.

Counting of the ballots will begin the morning of March 15, with results expected to be presented to the council at its meeting after the Spring Joint Computer Conference in May.

Opposition to the editorial publications board proposal appeared light, and centered around an opinion that the present arrangement is "satisfactory and should not be changed." It was suggested that the publications board chairman should be an officer serving with the president, vice-president, secretary and treasurer.

It was also suggested that the ACM Council, which would select the publications board members, could choose a member who would be neither a council member nor a member of the current editorial board, and this was called a disadvantage and cause for failure of the amendment.

L.A. Vote Count May Have Had Some Problems

CW West Coast Bureau

LOS ANGELES—Computerized voting once again is in the spotlight here where the last election was supposed to have the most perfect vote count it had ever had in its history.

With checks and double checks applied nevertheless, an unemployed spot welder who examined the records revealed that the absentee ballot totals exceeded the number of votes cast in certain districts. For example, in the 60th assembly district there were 3,296 absentee envelopes counted, but the total number of votes counted for all candidates was 4,108.

A recount of the votes was run through the computer and another investigation was initiated. In all, there were 50 districts in which discrepancies occurred. James Allison, county registrar-recorder, told CW that the error was not in the computer operation but in the manual handling of the count. All absentee votes arrive in envelopes identified by their assembly district and their congressional district.

These envelopes were manually counted, but in recording the totals they were not applied in all cases to the proper district. He said the complete total of absentee votes received is equal to the number of votes credited to the candidates.

Allison said the weakness in the system is that there is not a computer check of ballots received and counted to see if they tally correctly.

Allison pointed out that no errors were revealed in the general count and he is confident of its accuracy.

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Less than one year later, Century Data introduced the CDS 214, a disk drive that's actually twice as good as the CDS 114. The explanation is simple: the CDS 214 is two 114's in a single cabinet. It gives you 58 million 8-bit bytes of storage in half the space it took before.

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Larger Businesses Turn to IRS Mag Tape Filing Plan

By Edward J. Bride
CW Staff Writer

WASHINGTON, D.C. — Portions of business tax returns can be filed on magnetic tape, without paper backup, under a 1969 Internal Revenue Service (IRS) program that is gaining favor with larger businesses.

The magnetic tape filing program can also be utilized by service bureaus which perform accounting applications for smaller businesses, tax officials announced.

Under recent IRS policy data media can now also be used to store business records for tax purposes [CW, March 31].

The IRS Regional Service Center in Andover, Mass., estimates it will handle 28 million "paper" forms without handling the paper this year. The center serves all of New England and

New York State, processing 18 million returns annually.

Businesses can file their forms W-2 (earnings), 1099 (interest, rent royalties), and 1087 (dividends and certain other distributions) on magnetic tape, without hard copy backup. The W-2 must still be provided to individual employees, but the business and IRS can eliminate their paper copies.

Employees must be informed of all income "in a manner conducive to proper reporting on their tax returns," the IRS has cautioned, but this can be in

several formats, including a simple computer printout headed by appropriate income categories.

Tape reporting is not restricted to employers (or service bureaus or agents, collectively called "payers") capable of submitting all information on magnetic tape. A combination of tape records and paper documents is permitted, IRS said, as long as there is no duplication or omission of documents.

"Payers" must file an application for magnetic tape filing, but the tax agency said generally

payers using equipment compatible with the service's can "presume that tape reporting will be approved."

Additionally, the service may be able to find conversion facilities, and will disapprove magnetic tape filing "only when . . . unable to obtain facilities to convert a payer's file to a compatible form," the IRS stated.

Compatibility in this context means the following: 1/2 in. Mylar base tape, oxide coated, recorded at 556 or 800 char/in., even parity, with 3/4-in. inter-record gap, in 7-channel BCD.

Conversion facilities are available for 9-channel Ebcidic, 9-channel Ascii, odd parity, and 200 or 1,600 densities.

The IRS said it would attempt to find conversion facilities for any other characteristics listed on the application form, even if those characteristics differ from these specifications.

Format for requesting permission to take part in this program, and the reporting format itself, can be obtained from the "Mag. Tape Filing Coordinator" or chief of program analysis staff at any of the service centers.

Students Get Tips On Progress In Economics

CW Midwest Bureau

MADISON, Wis. — An economics professor here at the University of Wisconsin has programmed a course in introductory economics so that his students can obtain a quick feedback on their progress.

Prof. Allen C. Kelley has innovated a testing system utilizing the university's computer facilities. With his system, Tips (teaching information processing system), Kelley feels that his 300 students receive individual attention.

The course is programmed into the computer system in the university's center. Each week the students take a quiz in the course, which is also fed to the computer. Kelley feels that the weekly test is an excellent method for the student to demonstrate his achievements and weaknesses in the subject.

Within a few hours after completing the test quiz, the student obtains the results of his efforts, as well as individualized instructions on how to eliminate any weaknesses discovered or how to capitalize on strengths demonstrated.

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University Keeps Data Bank on Students

CORTLAND, N.Y. — Over 700 items of personal information on students at the State University of New York campus here are maintained in a school data bank.

Designed initially as an admissions aid, the data bank has enabled the school to cut the failure rate in half. But expanded use of the data bank has raised questions about invasion of the students' privacy.

Most of the data comes from prospective student application forms. The computer projects the average grade the person

would receive at Cortland as a freshman, and this prediction is the main criteria for acceptance.

Information from the data bank is not released to outsiders without permission from a higher official such as the registrar, according to Robert Wheeler, director of the computer center. Apparently data is never released to prospective employers, but Wheeler said that information from the computer had been given to the police.

Students have a right to check their files for accuracy, Wheeler said, but so far no one has. A

check with students indicated that few even knew the data bank existed.

Students may refuse to give some of the information the school requests, according to Wheeler, but he admitted that the students were not told this.

When a student registers each semester, he is given a printout of those items most likely to change, such as address and vehicle registration, which he can update and correct. But the school does not voluntarily give him printouts of the other information in the data bank.

The data bank is now on the school's Univac 9300, but will soon be switched to another computer which will allow the installation of direct access CRT terminals in the admissions and registrar's offices.

Students' special interests, information on financial aid and marital status of parents are included in the data bank. If a student lives off-campus, the data may even include the name of the landlady.

'No Limits'

At present, the data bank contains subjective opinion or comments, but Wheeler noted: "I don't see any limits to the kind of information you can keep on a person."

Most of the data is written in numerical codes, rather than natural codes, Wheeler said.

The PDP-11 Family Grows On This month: COMTEX-11

The greatest data communications software story ever told.

Start with this: the PDP-11 UNIBUS™ concept. UNIBUS is a natural system multiplexer with built-in hardware interrupt — ideal for multiple, asynchronous and synchronous communications lines, expendable by its very nature. Add the COMTEX-11 executive to schedule software interrupt service routines between or over hardware priorities. Already you have extraordinary communications handling power, but read on.

Next, the terminal applications packages — prepared and ready for many types of terminals, probably including the ones you're using. But COMTEX software is soft where it should be soft: you can add to the system by writing your own terminal applications packages, and when you do, you'll find that COMTEX-11 is transparent — no need to worry about timing problems, line protocol, and other such nuisances. Software end terminals can be mixed and matched, because all commands are device independent.

Which brings us to the interface controllers, choice of four. First is a 16-line, single speed multiplexer for low-cost data concentration. Second is a single-line, asynchronous interface with programmable character size and baud rate — ideal for service bureau-type systems. Third is a synchronous line interface for remote concentrating. Fourth is an automatic ceiling interface.

Combined with the unique and powerful architecture of the PDP-11, COMTEX-11 is ideal for store-and-forward message switching, source data collection, remote job entry, text editing, message concentrating, inventory control, and remote batching. In whatever application, its price/performance is unequalled.

Now that you've read the introduction, get the unabridged story. Next month still another member will join the PDP-11 family, Digital Equipment Corporation, Main Street, Maynard, Mass. 01754, (617) 897-5111.

digital

FBI's Records Useful Abroad

UTRECHT, The Netherlands — A Dutch citizen had a newly purchased 1970 Buick impounded recently after a check by the FBI's National Crime Information Center computer in the U.S. showed the car was stolen in Los Angeles about three months earlier.

The Netherlands Federal Police Agency requested the check when the car was presented for customs registration here. The Dutch citizen had purchased the automobile in Rotterdam, Holland, from an "unidentified person," according to U.S. officials.

The FBI has assisted overseas police agencies on other occasions. A request from the West German police resulted in restoration of a Porsche Targa to its rightful owner, also in Los Angeles, but nine months after the theft.

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Page 17

Random Notes

CCI Puts Analytical Subsystems in TSBP

ENGLEWOOD, Colo. — Computing Corporation International has added two systems, at no extra cost, to its Time Sharing Business Package (TSBP) and Mini Computer Business Package (MCBP).

Analyze, the first system, permits rapid statistical analysis of a company's permanent data base. The user programs a logic statement that expresses his criterion for counting, selection, retrieval and printout. Any logical combination of information within a data base file may be used.

Incomp, the second system, performs analysis of commercial income property to determine profit, cash flow and yield on investment. Once all data on a property is entered, the program becomes a model whereby any data may be altered to view the effect on income, cash flow and yield.

The company is at 3375 So. Bancroft.

A/R Package Prepares Bills, Ages Accounts, Costs \$1,000

NEW YORK — Users with at least 65K bytes of memory on an IBM 360 can install an accounts receivable system from PDA Systems Inc. for less than \$1,000. The package provides complete balance forward accounting, automatic aging of accounts, statement generation and a dunning report.

Written in Cobol, the package costs \$960. Optional features include a letter writing package to produce dunning letters. The firm is at 12 E. 86th Street.

Package for Bank Credit Cards Permits On-Line Authorization

CHERRY HILL, N.J. — Banks can perform their own charge card accounting or meet the processing requirements of either BankAmericard or Interbank, with the 1100 Series of Bankers systems from Arthur S. Krenzelky and Co.

The 1100 series system includes descriptive billing, interchange settlement and exception reporting for control of credit.

The programs are written in Cobol for an IBM 360/30 with 65K bytes of memory and at least one 2311 or 2314 disk unit. The package costs \$15,000, from 1010 South Kings Highway.

Freight Rate "Ponies" Produced, Kept Tightly by Numerex

ENGLEWOOD CLIFFS, N.J. — Two systems which produce and continuously maintain motor end rail freight rate "ponies" are available from Numerex Inc., as services or packages.

An initial charge to institute the service generally runs between \$14,000 and \$20,000, Numerex said, depending on the number, size, and format of the rate books currently in use. Numerex Inc. is at 467 Sylvan Ave.

Service Matches Buyers, Homes

NASHVILLE, Tenn. — Banks from Florida to Ohio are now using a real estate search service provided by ComputeHome, to match prospective home buyers with available properties.

The service is generally free to the buyer, with real estate agencies paying a fee to ComputeHome to participate. Details are available from ComputeHome, West End Building, here.

NCR Adds Century Flowchart Package

By Don Leavitt
on staff writer

DAYTON, Ohio — Users of NCR Century series mainframes can generate standardized program and system documentation with the Netflow support package from NCR.

Netflow eliminates manual preparation

of flowcharts of programs written in NCR's Next/J Language. Other languages available on the Century series, including Cobol, are not supported by Netflow and an NCR spokesman said he saw no plans for such support in the future.

Functioning on either of two levels, Netflow can be used to document logical

steps within a program, or to diagram the relationship between programs within a system.

The package is similar in concept, on the program flowcharting level, to Applied Data Research's Autoflow, but the ADR system does not support Next/J programs.

The program flowcharting section of Netflow generates detailed charts, with standard symbols and fully identified decision branches, to show the functional relationship of program steps. It also provides a formatted data listing and an alphabetic reference list as part of the documentation. The system generates a "top-level" flowchart to show how several programs within a system are interrelated, identifying interconnecting files by type and name.

Netflow is able to chart eight input and eight output files for each program in a system, NCR said. It also provides descriptive text for system and program explanation, based on comment cards within Next/J source programs. Netflow leases for \$650 under a three-year license, or \$850 for an indefinite-term lease.

Payables Processed Via Remote Batches

SAN MATEO, Calif. — Users of IBM 360s or Burroughs B-5500 can process accounts payable in on-line or remote batch modes with a package available from URS Systems Corp.

The system is said to provide effective control of monetary obligations, and projections of cash requirements.

One program written in ANS Cobol for the IBM 360 provides the user with two operating methods. With one, the user is "commitment-oriented."

The other method is invoice-oriented and handles those documents directly, without considering the purchase order. The simpler version requires a 32K byte storage; the more complex one takes 65K bytes. Either can operate under DOS or OS/360. Price of any version of the URS Accounts Payable package is \$6,000, from 155 Bover Road.

Also for 5500 Users
360 Hosts Univac 1005 Programs

FORT LEE, N.J. — Users still running applications on Univac 1005s can move their programs, without modification or recompilation, directly onto Univac 9000 or IBM 360 systems, with the 1005 Eliminator package, from Data Usage Corp. (DUC).

Use of the package not only eliminates the need for the 1005, but should significantly improve execution times, DUC said. Most 1005 programs operating under the Eliminator execute at the speed of the host machine.

In one case cited by the company, 85% of a user's 1005 program library was executed at the full speed of a Univac 9300. It is possible, however, that some 1005 programs, using special hardware features may take longer to execute.

The Eliminator is said to use a "dynamic translation" approach to program

transformation. This translates 1005 code into executable form on the host machine the first time each instruction is used. When subsequent executions of an instruction are required, the host machine executes the translated equivalent rather than simulating the 1005. The technique is said to maintain the accuracy of simulation, while approximating the efficiency of a conventionally translated program.

The package can operate on any Univac 9000 or IBM 360, including the Model 20. It requires a minimum of 16K bytes of storage, but gains efficiency if more core is available. Storage of 24K bytes is considered a "reasonable" core size for the package, the company noted. The system purchase price is \$4,500, from 2460 Lemoine Ave.

Philips Mini Handles Payrolls

NEW YORK — Users of the Philips P-353 business-oriented minicomputer can produce weekly payroll checks, update employee records and prepare IRS 941A and 942 forms, with a payroll software system available from Philips Business Systems.

The system calculates federal, state and local taxes. Seven categories of taxes and nine types of fixed deductions can be calculated for each employee, the company said.

The program also itemizes nine pay classifications, such as bonus, holiday or incentive, and identifies each on the

printed pay stub. FICA deductions are automatically stopped when the maximum is reached.

The system uses magnetic ledger cards for employee earnings records. The system permits entry of new employees and changes in data on current employees.

The development of a payroll system broadens the capabilities of the P-353 which previously was geared to invoicing, accounts receivable, inventory and general ledger.

The payroll package is available at a lease cost of \$20/mo from Philips at 100 E. 42nd St.

Calcomp Routines Allow Users
Choice of Lettering Styles

ANAHEIM, Calif. — A Drafting Letter and Symbol Set (DLSS) subroutine available from California Computer Products Inc. (Calcomp) allows users of the firm's CRTs or plotters to generate symbols similar to those produced with manual lettering devices.

Another Calcomp subroutine, the Block Lettering and Symbol Set (BLSS), is also available for more conventional CRT or plotter symbol generation.

Each of the subroutines is based on a somewhat larger reference grid than the standard Calcomp symbol characters. This allows significant smoothing of all characters, the company said.

The subroutines allow the user to define the ratio of character height to width, call for italicization to either right or left, and specify the required spacing between characters, a spokesman said.

Each of the subroutines has a "set mode" call allowing the user to initialize selected options.

A similar package, Scribe, from Applied Computer Graphics, also generates curved letters for either CRT or plotters, but uses the standard five-by-eight matrix used by the general plotter routine called Symbol. Scribe (CW, Jan. 20) has been implemented on a CDC 6600, and provides a 4-character set compared to 78 characters available with DLSS or BLSS.

The Calcomp subroutines are supported on most mainframes, from Burroughs B-5500 to ADP Systems 57, and the individual system includes Fortran IV G-level compilation capability. Either of the subroutines is available at a one-time lease charge of \$600. The firm is at 2411 West LaPalma.

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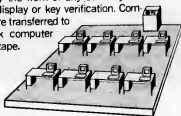
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 **INFOREX**





Proper Planning Called Key to Successful OS Usage

By Don Leavitt
CW Staff Writer

Many users complain about OS/360, but some of them may not know how to use it correctly. The system is, of course, IBM's main operating system for larger model 360s and 370s.

Many anti-OS comments appear to come from users in smaller installations that are marginal in size in terms of using OS.

The OS Supervisor takes vast amounts of core and one unhappy user noted that he can get more capabilities in less core from a fully implemented DOS than he could from a limited OS. He said he could not justify the expansion of core that would have been necessary to make OS work for him.

Some users unhappy with OS have chosen to make the switch from the lower-level DOS gradually. Apparently the mixing of operating systems creates an undue level of confusion among

personnel. This leads them to blame the OS portion of the mixed job stream for any problems.

Users who have switched all at once from DOS to OS also admit to having had similar problems. But in this situation, trouble was more expected. In any case,

Analysis

problems apparently are handled more easily when the switch-over is complete.

Planning Is Vital

As in all phases of data processing, planning is the key to successful use of OS.

Planning includes not only proper training in JCL but, in many installations, a reorganization of the operating staff as well. "Run books" in the traditional sense have in some cases been replaced by

a 'set-up crew' that is responsible for maintaining the JCL cards for each program.

In one installation, the set-up crew also functions as tape and disk handlers and printer forms changers, all under a console operator, whose duties are reflected in his title, console commander.

Despite an undertow of comments to the contrary, many users in large 360 installations apparently agree that economies of size make the use of OS/360 "mandatory."

The 360s are so large and have such tremendous capabilities, according to these users, that OS is required to use the machines effectively.

Complex JCL

The Job Control Language (JCL) used with OS is more complex than the JCL used with DOS but most large users said that this is not a real problem area. Familiarity with the DOS requirements

and good training on the changes required for OS turn JCL preparation into a routine job for some of these installations.

One of the features OS users like best is the standard priority system that allows them to interrupt a job stream with a high priority job, and then return to the work that was in progress.

Managers seem equally pleased with the automatic 'short' that rejects a program that hangs up. On earlier systems, the CPU would halt and the operator might try to get around the problem, only to create a larger one in the process.

The cleaner the programs, the cleaner the conversion to OS. Users note that OS is a demanding enough system so that the programs have to be in excellent condition to be handled. For most Cobol programs that work under DOS, a re compilation is all that is necessary, they said.

Remote Plan Writes Medical Statements

RIVERSIDE, Calif. — Accounting firms can provide billing, insurance form processing and accounts receivable management for doctors, professional groups, clinics and small hospitals, with the Medical Systems Associate (MSA) remote batch processing plan from Occidental Computer.

Under the MSA plan, the remote batch terminal in the user's site is polled daily. New entries are edited and a listing of transactions accepted or rejected is transmitted back to the user.

Weekly output of the system includes a cumulative balance report, showing in alphabetical order, balances due on open accounts, up-to-date totals of the business activities of the doctor, group or clinic. Monthly, or at the end of each billing period, the plan can produce insurance, Medicare or Medicaid forms.

All large reports and statements are mailed directly to the doctors or patients. Cost of the Associate plan is 25 cent/statement produced, the company said.

The same charge is made for each insurance form generated, or new patient master added to the user's file. Cost of the remote batch equipment, which usually includes a CRT terminal with tape cassettes and a printer, is borne by the user.

Occidental is at 6600 Jurupa Avenue.

Stockholder Accounting Produces Checks, 1099s

MANASQUAN, N.J. — Users responsible for stockholder accounting can produce mandatory reports, dividend checks and proxy statements with the Capital Stock System (CSS) available from REM Computer Products Inc.

Particularly useful to registrars and transfer agents, the system is organized to handle multiple corporations.

Extensive checking routines are said to prevent the issuance of duplicate stock certificate numbers, and to insure that no transactions are lost.

Other output includes the SEC-required stock exchange report, showing shareholders by state by odd and round lots. In addition to dividend checks, CSS prepares the IRS-required 1099 forms.

The files used by CSS are more detailed than those of comparable systems, the company said.

Developed by Optimal Systems Research Inc., CSS is presently available for use in a 48K byte partition under DOS/360. It requires two tapes and either tape or disk storage facilities.

Written in Cobol, it can be easily modified for other computers, according to the developer. The package costs \$15,000 without modifications. REM is at 200 Atlantic Ave.

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March 10, 1971

Page 21

Bits and Pieces

Mohawk Cuts Prices
On System 9000

HERKIMER, N.Y. — Prices on the System 9000 have been reduced by Mohawk Data Systems, making it the only eight to 32 keyboard data preparation system leasing for under \$100/mo per keystation, according to the company.

Effective immediately the price of an 8-station system is \$98/mo per keystation including maintenance. A 32-station system rents for \$81/mo per keystation. Three-year leases at lower prices are also available, Mohawk said.

Ease of operation, data throughput rates, and reliability have not been sacrificed, Mohawk said. Options, such as accumulators, check digits, etc. will continue to be available.

Cybercom Adds Tape Converter To Mark I Key Encoder System
SUNNYVALE, Calif. — Cybercom has added a 1,800 bit/in. tape converter to its Mark I Key Encoder System. A stand-alone key-to-tape system, the Mark I records data from the keyboard to quarter-inch tape cassettes, then pools the data into computer tape at a converter station.

Output formats for half-inch tape include 7-channel, 200 to 800 bit/in. and 9-channel, 800 bit/in. and 1,600 bit/in. The tape converter is designed to handle the workload of up to 15 key encoder stations.

The converter is available to Mark I system users at the cost of maintenance, \$20/mo. The device is also available at a cost of \$200/mo or \$10,700 to other users. The device is currently on a 30- to 60-day delivery schedule from 432 Toyama Drive.

Quantor Options to 1.2.3 COM Include Tape Drives, Camera
CUPERTINO, Calif. — Quantor Corp. has added three options to the Quantor 1.2.3 system.

The user may now specify a 9-track 800 bit/in. tape drive, 7-track 566 or 800 bit/in. drive, switch selectable. Nine-track 1,600 bit/in. capability is also available. The third option is a 16mm/105mm camera.

Prices for the options, available in June, were not available. The firm is at 1900 Homestead Road.

Enclosure Cuts Down TTY Noise
SUNNYVALE, Calif. — The noise level generated by a Model 33 Teletype can be reduced by 35%, according to Anderson Jacobsen, through the use of the company's Quiet Enclosure. The enclosure features a fan to preclude over-heating and has separately hinged doors to provide access to the acoustic data coupler and the tape reader and punch.

The simulated wood grain finished enclosure is priced at \$232 and is leased for \$10/mo from 1065 Morse Ave.

Paklean Cleans 1316/2316 Disks
OKLAHOMA CITY, Okla. — The Intracore Paklean disk pack cleaner that removes a disk drive, can clean both 1316 and 2316 type packs. It conforms to manufacturers' recommended cleaning methods and performs the cleaning off-line without direct handling of the pack.

Paklean sells for approximately \$1,000 and is available through P.O. Box 76470.

3420/3803-Compatible

TI Tape System Priced 20% Below IBM

By Frank Plaza

CW Staff Writer

STAFFORD, Texas — Texas Instruments has become the second supplier of independent peripherals to offer a tape drive subsystem that is compatible with the IBM 3420/3803 to 360 and 370 users.

The Series 934 Magnetic Tape Transports and 9803 Magnetic Tape Controllers offer lease savings up to 20% over

comparable IBM subsystems, TI said. The 934-3, 934-5 and 934-7 handle speeds of 75, 125, and 200 in./sec, respectively. The three models offer recording densities of 800 and 1,600 bit/in. for the 9-track drives, or 556 and 800 bit/in. for the 7-track drives.

The transports feature single capstan drive, automatic threading, radial interface, and designed-in reliability for

greater uptime and minimum maintenance, TI said.

The 9803 controller features include dual density (7- and 9-track compatibility), solid-state monolithic electronics, and radial organization, as in the IBM 3803/3420, to permit individual tape transport attachment and off-line switching.

Switching options are also available for program controller operation of up to 16 transports by as many as four controllers and individual drive availability to two different computer systems.

Lease prices start at \$375/mo for the tape drive and \$625/mo for the controller. Prices for the IBM 3420/3803 tape drive and controller are \$440/mo and \$675/mo. The similar Tote Series 6000 units are priced at \$375/mo and \$575/mo, by way of comparison. IBM has set first deliveries for next October, while Tote has sales start November.

The purchase prices of the TI 934 tape drives range from \$14,500 to \$18,100, while the controller sells for \$16,100.

Delivery of the Series 934/9803 subsystem is scheduled to begin early in 1972 from 12303 Southwest Freeway.

Low Cost and Communications
Offered by Key-Edit Models

WALTHAM, Mass. — Consolidated Computer Ltd. has expanded its Key-Edit data preparation system by adding models 85 and 145 to its existing equipment.

The Model 85 provides keypunch and key-to-tape capabilities plus concurrent data entry and data verification with automatic pooling.

It is a less expensive version of the original Key-Edit system, now designated the Model 100. The basic Model 145 offers a high level of editing and control, and features the ability to be used in a communications network. It is the first system to offer on-line remote job entry capability, the firm claimed.

The Model 85, available with from 20 to 32 keystations, is intended for users who enter large volumes of data with a minimum of source editing.

The system includes a 12K PDP-8, 7- or 9-track mag tape drive, fixed head drum, and an ASR 33 Teletype supervisory control console.

The Model 85 ranges in price from \$22,000/mo for a 20-keyboard system to \$32,000/mo for a 32-keyboard system. Deliveries begin in July.

The Model 145 is designed as a terminal-processor for linking remote branches with a central location. It can use a variety of peripherals including printers,

card readers and paper tape readers.

High speed data adapters and communications software allow the 145 to be connected on-line to another Key-Edit system or to a computer.

The basic 145 includes a 16K PDP-8, tape drive fixed-head drum, supervisors console and from four to seven keystations.

Model 145 deliveries are scheduled to begin in July, 1971. Lease prices begin at \$975/mo.

Terminal Doubles as Keypunch

DEERFIELD, Ill. — A remote data terminal that can be used off-line as a keypunch/verifier, the Kleinschmidt Model 351 Communications/Data System is intended for use at a polled communications site.

Consisting of a verifying keypunch, serial printer, card reader and an electronic control unit, the 351 can be used for off-line composing, listing and editing as well as for data communications, the firm said.

Up to 23 stations can be interconnected to one control center, with each station or stations pollable by the control Data is transmitted to the network through the card reader and received through the printer and card punch. Data transmission

rate is 20 char/sec.

When used off-line, the 351 can be used to punch and verify 80-column cards. The verification procedure is unusual as the data when originally keyed is stored in a buffer. Data is then relayed by the operator and if a discrepancy between the buffer contents and the keyed stroke occurs, it is called to the operator's attention. Errors are corrected in the buffer before the card is punched.

The card reader and printer can be used to list punched cards, with a limited degree of field selection.

The price of the 351 ranges from \$11,500 to \$15,000. Lease plans are available and first deliveries are scheduled for June, 1971.

Bryant Offers Plug-to-Plug
Replacements for IBM 2314

By Don Leavitt

CW Staff Writer

WALLED LAKE, Mich. — IBM 360 users have another IBM-compatible disk system to consider, with the availability of the Series 2200 Direct Access Storage Facility from Bryant Computer Products.

The new units are plug-to-plug compatible with the IBM 2314 and 2315 systems in function, interface and general styling, at a "significantly" lower cost, a spokesman said.

The 2200 system consists of single, dual or triple drive units, and a 2214 interface controller. The drives are also data compatible with the IBM units they are designed to replace, and can use IBM 2316 or equivalent disk packs, he added.

The 2200 Facility is available in module configurations identical to the IBM units, including an optional two channel switch. This is said to be equivalent to IBM's 8171 two-channel that enables two processor channels to time-share data stored in the disk units.

About 10% Cheaper

While Bryant said the 2200 units would be lower in cost than the IBM units, the firm refused to cite specific prices. A spokesman said the Bryant units would be "more than 10% lower" than IBM.

The new systems are not Bryant's first IBM-compatible products. The company previously announced the Series 1400 disk system, which is compatible with IBM's 2311.

First deliveries of the Series 2200 are scheduled for the second quarter of this year. The firm is at 850 Ladd Rd.

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Certification Plan Proposed

Rochester Telephone Would Simplify Interconnection

By Ronald A. Frank

CW Technical News Editor

ROCHESTER, N.Y. — An independent telephone company here has proposed a plan that would simplify the interconnection of non-carrier data equipment to its facilities. However, rates planned for the service may prove to be higher than comparable interconnection services available from Bell System companies.

The interconnection plan is part of a proposed tariff filed by Rochester Telephone with the N.Y. Public Service Commission (PSC). The commission has suspended the tariff which would have taken effect on March 7, pending hearings to further explore the proposal.

As part of the proposed tariff, Rochester Telephone said that "customer owned and maintained" (Coam) equipment would be interconnected through a cer-

tification program together with a protective device described as much simpler than the DAA access arrangement currently required under Bell System tariffs.

The Coam user would be a new class of customer for Rochester Telephone since the company has not previously filed an interconnection tariff. Proposed monthly rates for Coam service would be \$9.50

Communications

per business "Access Line." An industry observer told CW that comparable monthly Bell rates average about \$7.50 per line.

As proposed in the tariff, Coam data users would have their equipment certified by Rochester Telephone personnel to determine that it would not cause harm to telephone equipment. In addition,

the phone company would provide a "simple protective device" primarily designed to assure that no harmful signals would be transmitted.

In describing the protective device, a Rochester Telephone spokesman told CW that one model will be used for all types of data equipment interconnections. Although the company has not yet determined an official designation for the unit, the spokesman said that it would be provided free of charge to users. Current Bell System interconnection tariffs include the use of several DAA models each of which adds a monthly rental charge to a user's telephone bill.

Under the Coam interconnection plan, a Rochester Telephone representative would inspect a user's site and go through a technical check-off list to determine whether the data equipment would qual-

ify for certification.

Once a site has been certified, the data user would be required to notify the telephone company of any changes in his equipment configuration. The installation would then have to be recertified, a Rochester Telephone spokesman said.

The certification proposal would be similar to recommendations made last year in the Dittmer report to the Federal Communications Commission. That report, together with a study by the National Academy of Sciences, cited equipment certification as one method to speed the interconnection of non-carrier data equipment without causing harm to the telephone network. The Bell System has not proposed a certification plan for non-Bell users.

The Bell System company directly affected by the Rochester Telephone interconnection proposal would be New York Telephone Co. Rochester area data users would probably go through N.Y. Bell facilities on interstate data calls.

"We are looking into [the proposed tariff] on the technical side," a N.Y. Bell spokesman told CW. "This is a new departure that could involve the entire AT&T company."

An AT&T spokesman said that his company has on various occasions reiterated its position that all Bell System companies should use "some sort of access arrangement."

A Rochester Telephone spokesman declared: "We are not considering [the proposed protective device] as a data access arrangement unit. We don't think this will be a burden to the data customer. We think it will be much easier to use, and it will not interfere with AT&T network operation."

He added that the protective device would be available immediately when the tariff is approved by the PSC.

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AT&T Would Explore NAS Study Findings

NEW YORK — AT&T is ready to explore a 1970 National Academy of Sciences recommendation calling for a program of standardization and certification to interconnect customer-provided data facilities.

The statement was made by AT&T Board Chairman H.J. Romnes in the firm's annual report for 1970, released recently. Saying that the company was prepared to consider the proposal, Romnes added: "We are not ready to commit to any programs that would weaken service protection."

"Unrestricted linkage" of customer-provided equipment to AT&T facilities could cause "hazards to quality communications service," according to the AT&T official. He said approved Bell connecting arrangements were required to protect against such hazards.

On the need for new common carriers such as MCI and Datan, Romnes said AT&T "does not believe... that the public interest would be best served by permitting the virtually unrestricted entry of competing carriers that [the FCC's] staff proposes."

He urged the fullest exploration of the impact such entry would have on AT&T's system of nationwide average pricing.

In the area of new developments, Romnes said Bell Laboratories is working on a high-speed solid-state switching system. Using time-division switching technology, the system "will be readily adaptable to digital transmission," he said.

He reiterated Bell's plans to have a digital system serving "most major U.S. cities" in operation by the middle of this decade.



The Phoenix ASM Chapter teaches prisoners a business systems course.

Economics Is Suddenly 'In'

SCHENECTADY, N.Y. — Five years ago a course in macroeconomics at Union College regularly attracted only a handful of students and was generally considered a "sleeper" by undergraduates.

This winter, more than 75 students have signed up for the course which deals with broad economic theory and national policy and the enrollment has to be limited because of overflow demand.

The cause of this renaissance of interest in macroeconomics is neither unique at the college nor necessarily indicative of the sometimes fickle taste of students. The major appeal of the course is the current use of a GE 415 computer.

It is used in economics for such problems as the nation's unemployment rate or tax level, and by students in the social sciences and the humanities. Projects include analyzing election results and voter patterns, verifying the authenticity of works attributed to certain authors, and establishing word use groupings that make the teaching of foreign languages easier.

"A person who doesn't understand computers risks becoming an illiterate in modern society," says Theodore G. Schwarz, Union's director of information systems and computer services.

Schwarz, whose computer center runs 22 hours a day, estimates that between 70% and 80% of all Union students have some experience in data processing before they graduate.

School Scheduling Expedited With DP

PORT HURON, Mich. — Not too long ago class schedules in the Port Huron Area School District had to be planned by hand, a procedure that usually took several months, beginning in March and finishing in September when the schools opened.

Three and a half years ago that all changed. An IBM 360/20 was installed in the DP department of the school system. Class cards for about 30 schools are taken to the DP department. A detail card is punched out naming the student, the classes he wants, and his grade.

After inventorying pupil needs, the next step is to find conflicts in courses.

Other problems the computer helps solve include size of classes. A language has to be planned so enough pupils will be left in the last year of the course for a class to be conducted.

Also, class size must match with the size of the classroom so that 30 youngsters will not be jammed into a classroom meant for only 20.

UK Trains Blind for Jobs As Government Programmers

LONDON — The Civil Service Department will train more blind persons as programmers to work on government computers.

The latest 12-week course, with 10 blind civil servants, has a three-week introduction to DF, a one-week set exercises and study session, and an eight-week course on Cobol.

For a blind programmer, visual media for computer input and output are converted to verbal or tactile form. The equipment includes Braille writers, modified typewriters with special computer symbols and dictation machines.

Programmers In Prison Learn About Business

FLORENCE, Ariz. — The Association for Systems Management (ASM) has entered the Arizona State Prison as the Phoenix Chapter of ASM undertook what is reportedly an educational "first" in the state prison system.

Through the efforts of Stanley R. Butterworth (ASM) and Ken Murray, chief of correctional industries, a class in business systems was started for eight inmate members of the Arizona Data Accessing, Programming and Training (Adapt) group at the prison.

The 16-week course covers all phases of systems analysis with emphasis on designing more efficient business systems.



COMPUTERWORLD

education

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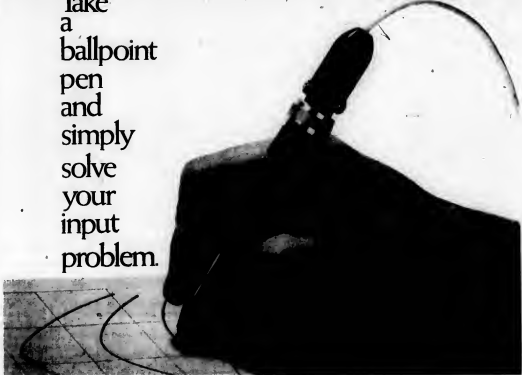
WHITE PLAINS, N.Y. — Advanced courses in computer systems science will be offered in three additional cities by IBM.

The courses will be given at new IBM Systems Science Institutes opened in Washington, Chicago and Los Angeles, as well as in New York City, where they were previously offered as part of IBM's Advanced Systems Science Education Program.

The curriculum consists of the following courses, with more to be added as they are developed:

- Design and analysis of communication-based systems; four weeks, \$1,600.
- Design and analysis of data-based systems; two weeks, \$920 (for graduates of communication-based systems course).
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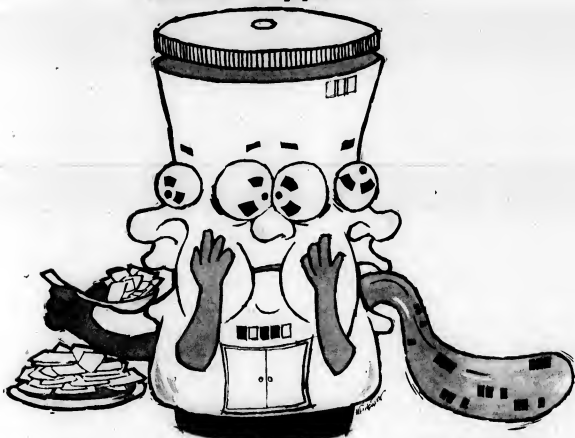
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Our February 24th Inputs Supplement

- will feature:
- Which user sites can make best use of various keyboard input systems?
 - What type of keyboard input system for you?
 - What are the future trends in remote batch?
 - Keypunches - new life in an old medium
- Our Independent Peripherals Inputs Supplement closes Feb. 5. Reserve your advertising space by filling out the coupon below, or contact your local Computerworld representative.

Our March 31st Memories Supplement

- will feature:
- Which user sites can make best use of bulk memories?
 - Can independent suppliers continue to provide savings to computer users?
 - The trend to disks.
 - What can independents offer besides lower prices?
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Our April 28th Outputs Supplement

- will feature:
- Which users can make best use of COM (computer output microfilm)?
 - Can plotters have any applications to business?
 - Printers - impact vs. non-impact, speed vs. copies.
 - Is off-line output worth the cost?
- Our Independent Peripherals Outputs Supplement closes April 9. Reserve your advertising space by filling out the coupon below, or call your local Computerworld representative.

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6 Area Police Departments Share T/S Net

NEW HOPE, Minn. — Police departments in six area municipalities have the capabilities of major computer systems under a time-sharing agreement with a Minneapolis company.

The project provides detailed analyses of police activities so that better allocation of manpower can be made. It also computerizes the regular

monthly reports required by the FBI and State Bureau of Criminal Apprehension.

The project stems from work that was carried out during the past year.

International Timesharing Corp. provides the computing power under a contract supported by a federal grant of

\$80,000.

In addition to New Hope and Burnsville, the other member cities are Edina, Crystal, Brooklyn Park and West St. Paul.

Project director Jack Morse called the project "unique," claiming it provided the "first practical approach" to giving computer capabilities to smaller cities.

Mini Provides Quick Lung Checkup With Aid of Spirometer System

OMAHA, Neb. — A minicomputer, tied to a wedge spirometer system, is being programmed to diagnose mechanical pulmonary abnormalities within 90 seconds at the University of Nebraska Medical Center here.

The continuing extensive case history study is being carried out in conjunction with the Nebraska State Tuberculosis and Respiratory Disease Association. A Varian 620/1 general-purpose digital computer with a 12K 16-bit word memory analyzes information from patient questionnaires.

"Vital Capacity"

The spirometer, in turn, measures the patient's lung "vital capacity," the volume of air produced by the deepest possible exhalation after the deepest possible inhalation.

The information collected is fed to the computer via punched tape, which diagnoses the personal qualitative pulmonary mechanical functions; the printout

indicates whether additional medical attention is advisable.

Nasa Functions Despite Quake

PASADENA, Calif. — When rocked by the recent California earthquake, the computer complex at Nasa's Jet Propulsion Laboratory here still functioned flawlessly, providing an important link in returning Apollo 14 astronauts to earth.

The 500 million computer complex was serving as a backup monitoring center for that manned flight, as well as receiving data from deep-space probes, when the earthquake chopped incoming power lines. An uninterruptible power supply, developed by General Electric, provided continuous power, to help assure safe splashdown for the astronauts and save irreplaceable information from deepspace.

MISSISSIPPI STATE CENTRAL DATA PROCESSING AUTHORITY

Advertisement for Bids

Sealed proposals will be received by the State Central Data Processing Authority, 508 Robert E. Lee Building, Jackson, Mississippi 39202, up until 2:00 p.m., Monday, March 22, 1971, for the following data processing equipment:

Request for Proposal No. 24 — Purchase of two (2) new or used Disk Storage Drives to attach to an existing IBM 1130 computer system.

Detailed proposal specifications may be obtained from the office of the State Central Data Processing Authority.

The State Central Data Processing Authority reserves the right to reject any and all bids and proposals and to waive informalities.

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Bills Would Open Technology Agencies

CW Washington Bureau

WASHINGTON, D.C. - Two bills have been introduced in the House of Representatives that have implications for the computer community.

One, H.R. 3269, would establish an Office of Technology Assessment for the Congress "as an aid in the identification and consideration of existing and probable impacts of technology."

POSITION ANNOUNCEMENTS

SYSTEMS & DATA PROCESSING ASSISTANT DIRECTOR

(#1650-81707)
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col application." The second, H.R. 3820, would establish a Department of Science and Technology, carved out of the transfer of certain agencies and functions.

"Early Warning"

As introduced by Rep. John W. Davis (D-La.), the basic responsibilities and duties of the Office of Technology Assessment would be to provide "an early warning of the probable impacts, positive and negative, of the applications of technology and to develop other coordinate information which may assist the Congress in determining the relative priorities of programs before it."

The second piece of legislation, H.R. 3820, introduced by Rep. Henry Helstoski (D-N.J.), would consolidate all the existing resources of the Federal Government devoted to science and technology.

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under a new department. The object would be to "permit the optimization of the federal investment and the orderly and fully coordinated pursuit of a national science plan" involving research development, testing and evaluation.

The department would encompass the operations of the National Science Foundation, the Atomic Energy Commission, the National Aeronautics and Space Administration, the National Bureau of Standards, portions of the Department of Defense, segments of the Smithsonian Institution and elements of the State Department.

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March 10, 1971

Page 29

CI Notes

Zyre's 155 Had Trouble

Zyre Corp.'s 370/155, the first to be delivered, was down for about 10 hours during its third week of operation, according to a Zyre official. Cause was a bad PC board. This was the only failure encountered in the first month of continuous operation, and Zyre continues to be very happy with the machine.

Crocker-Citizens Hopeful

A report by Crocker-Citizens National Bank in Los Angeles says that despite the recession, the computer industry in the area is still growing. The bank notes that in 1968 there were 42 DP firms in the area, and that the DP payroll included 18,600. In 1971, the bank said, there will be 100 firms employing 34,000 people. The annual payroll has risen from \$176 million in 1968 to \$340 million in 1970.

A Failure to Communicate?

And there I stood, with eye running down my face...

Intel's director of marketing Bob Graham was forced to write users of the 1101 256-bit MOS RAM that the units weren't quite up to specs. Seems the 1101, under certain power supply conditions, lost information during slow accessing. So Graham had to tell users to modify their power supplies to the smaller range of acceptable values.

So, happier than a hog in a wallow, Computer Microtechnology's Dave Conrad sent a letter to the same people saying that CM really liked their 1101, and second sourced it. Only it seems that CM followed Intel's original specs, and its CM1101 operates under all the original power supply conditions. At 60% of the power.

Supershorts

Equal opportunity? An employment ad placed in the *Houston Chronicle* by Tulsa-based Telex Corp. carried the comment "no aerospace, please." Seems Telex has been swamped with applications from high-speed aerospace engineers who don't fit its needs.

Collins Radio has the contract for a paging system to link American Airlines' passenger reservation system with its ticket agent stations across the country. Equipment valued at \$1.6 million will go on a five-year lease.

Wang Computer Products, Inc., Los Angeles, maker of magnetic tape drives, has received the Underwriters Laboratory "Notice of Acceptability" for its Model 7 and Model 10 units.

Reynolds & Reynolds, a major maker of business forms, as well as a DP service company, has ordered five Burroughs 8450A computers with a combined value of \$7.3 million.

And from the man bites dog editor: A cryptic little release says that Union Carbide has granted IBM a nonexclusive license to market and manufacture its industrial robots. No further details were disclosed.

Over \$14.5 Billion in '71

18% Rise in Computer Revenues Forecast

NEW YORK — Revenues to U.S. computer companies are expected to exceed \$14.5 billion this year, up 18% over 1970, according to estimates released by International Data Corp., a data gathering and market research company in the information processing industry.

IDC disclosed it expects worldwide shipments of new-built computer equipment to hit \$8.43 billion in 1971, up 16% over 1970. During 1969 and 1970, shipments hovered around the \$7.2-billion level set in 1968.

In reporting 1970 results to a group of financial analysts representing leading brokerage houses, mutual funds, banks and insurance companies, IDC noted that U.S. user spending on computer-related items was up 13% in 1970 and is expected to increase another 15% in 1971.

Computer shipments during 1970, as estimated by IDC, were up only 1% on a worldwide basis. With 41% of their new-built shipments outside the U.S., U.S.-based computer manufacturers saw an 11% decrease of new-built computer equipment shipped within this country and an offsetting 24% increase in shipments abroad.

For 1971, IDC estimated that about 43% of the estimated \$8.43 billion in shipments will be outside the U.S.

In its presentation, IDC emphasized the importance of revenues rather than shipments as the computer industry matures. "A few years ago," noted IDC President Patrick J. McGovern, "everyone was excited about shipments. Today, however, with the value of installed computers approaching the \$40-billion level, the relative importance of shipments is decreased."

"Those computers currently on rental will produce some \$6 billion in revenues this year whether any new equipment is shipped or not. This rental base has a strong flywheel effect on revenues - you can't slow it down or increase it very dramatically."

Thus, total revenues were up 15% in 1970 and - when business outside the U.S. is coupled with increased activity here - should increase another 17.5% this year.

Just over 61% of 1970 computer-related revenues went to general-purpose manufacturers, and IDC expects the percentage to grow to 62 this year as mainframe activity picks up. Other hardware areas -

Industry Sector	1970 Revenue (\$ millions)	1971 Revenue (\$ millions)	1970-1971 % Growth
General Purpose Computers	7,625	9,010	18%
Dedicated Application Computers	525	630	20
Independent Peripherals	570	720	26
Leasing	605	655	9
Software	535	550	3
Service Bureau & Time Sharing	1,235	1,505	22
EDP Education	170	200	20
Supplies	1,170	1,325	13
Totals	\$12,435	\$14,595	17.5%

Breakdown and Forecast of Revenue

dedicated application computers and independent peripherals - can also expect better than average revenue growth for 1971.

IDC's breakdown and forecast of revenue is shown in the accompanying chart. Growth in the independent peripheral area reflects the increasing acceptance of plug-to-plug compatible memories - tape and disks - as an easy way of achieving economies. Although IBM has recently exerted some pricing pressure in this area, IDC said that companies in this sector of the industry can expect another 26% revenue increase during 1971.

Dedicated application computers include process control systems, but with shipments in this area apparently awaiting the impact of IBM's System/7, this category virtually means minicomputers today.

During 1970, IDC reported, more than 11,000 minis - up 83% by number and 25% by value - were shipped. And the expected increase for 1971 - 20% by value - will represent shipments of 16,500 minicomputers, up another 45%. Growth by value, of course, is less dramatic than that by number because the average price per system continues to drop.

Third-Party Lease

The third-party leasing industry, IDC pointed out, ceased making major new purchases during 1970, dropping from an estimated \$1.4 billion in new purchases in 1968 to about \$300 million in 1970. Purchases this year should be no more

than \$150 million, IDC estimated, as leasing companies buy equipment only when necessary to make their third-generation systems attractive.

The largest non-hardware growth area will be that of service bureaus and time-sharing - substitutes for hardware to many computer users. With local batch service expected to grow about 19% to over \$1.1 billion in revenue, the even greater growth of remote batch, conventional time-sharing and computer information services give this area the second highest growth rate among all computer industry sectors.

From a small base, EDP education grew 40% in 1970, and should experience another 20% revenue growth in 1971, IDC said. Much of this increase will be the result of users opting for unbundled education from IBM as new systems are delivered, but accompanying this will be a significant shift to in-house education to minimize charges.

IDC's figures show that the independent software industry never received the expected boost from unbundling - partially because of the economy - and will not during 1971. Actual package sales are expected to be up some 65% during 1971, but decreases in contract system analysis and contracts from mainframe manufacturers should hold total software revenues to a minimal 3% growth during 1971.

Research Company To Study L.A. Quake

LOS ANGELES - Environmental Research Corp. has begun a study of the aftershocks which continue to shake Los Angeles following the major earthquake two weeks ago.

The study should provide "significant new information that will lead to improved methods of selecting building sites and designing structures," according to John K. Swearingen, vice-president and general manager of the Computer Sciences Corp. subsidiary.

Public utilities, construction companies, insurance firms and public works departments of local governments would particularly benefit from the information to be developed, he said.

Environmental Research will process and analyze data recorded by these instruments over a five-day period. The measurements are expected to disclose how varying ground motions affect buildings and on different types of soil strata.

IBM Would Sue CDC, Unit

MINNEAPOLIS — What's sauce for the goose is sauce for the gander, IBM said, and prepared to do some roasting of its own.

The roasting in question is Control Data Corp., which has been trying to pluck some of IBM's feathers by filing of an antitrust suit against IBM, though, has asked permission of a federal court to sue CDC on the same grounds.

IBM's suit would be in the form of counterclaim charges that CDC and its Commercial Credit Corp. subsidiary have combined efforts to illegally enhance CDC's competitive position. Industry sources estimate that in 1970 IBM shipped 65.5% of the newly built mainframes in the world, while CDC shipped 2.8%.

IBM's effort is apparently based on

material provided by CDC as part of the secret discovery portion of the current antitrust suit, which was filed over two years ago. Last year, three other plaintiffs dropped out of the suit, leaving CDC as the only competitor.

The U.S. Justice Department also filed an antitrust suit in December 1968. The pretrial stage of the actions is expected to last up to another year, and it will be even longer if IBM's counterclaim is allowed.

The court set a hearing date of late April to decide whether the counterclaim should be heard.

The IBM and CDC declined to comment on the action. An IBM statement noted that the company was prohibited by law from disclosing the charges until after the April hearing.

Bill Would Bar AT&T From Comsat Board

WASHINGTON, D.C. — Sen. Mike Gravel (D-Alaska) has introduced a bill in the Senate that would bar representatives of American Telephone & Telegraph Co. and other commercial communications carriers from sitting on the board of directors

and owing any stock of publicly owned Communications Satellite Corp. (Comsat).

Senate Bill S. 702, referred to the Committee on Commerce, would amend the Communications Satellite Act of 1962.

"An investigation into the relationship of Comsat and AT&T

officials will demonstrate that the nation's biggest monopoly has overpowered and outmaneuvered the fledgling Comsat management to the detriment of the public, the taxpayers, the government and the Comsat stockholders," said Gravel when introducing the bill.

The senator introduced a letter from Assistant Attorney General Richard McLaren which said that the elimination of direct carrier influence over Comsat "is consistent with the Department [Justice] original position [stated] in 1962." When the letter was first made public, Clay T. Whitehead, director of the Office of Telecommunications Policy, said that McLaren's comments "should not be interpreted as an administration recommendation."

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Datascan

Executive Corner

CDC Names VP for Memory Unit

MINNEAPOLIS — John V. Titsworth has been named vice-president of Control Data Corp.'s Memory Products Division.

Titsworth will direct the product planning, design engineering and manufacturing of Control Data's long memory products. Included in his responsibility are the Normande Operations in Minneapolis, which produces disk files and magnetic drums; operations in Omaha, Neb., which produces disk packs; and in Rapid City, S.D., which produces disk drive memories and associated sub-assemblies.

He will also have responsibility for the Magnetic Products Division which manufactures power supplies for the computer peripheral market, and various electro-mechanical devices for the avionics marketplace.

Other Moves

■ Codex Corp., Newton, Mass., has elected G. David Forney Jr. vice-president, research, and James C. Hart vice-president, engineering. Farrel D. Peltz has been appointed to the new post of vice-president, systems and services.

■ Elton B. Sherwin was named president of Continental Data Services Corp., San Francisco.

■ William G. Lucas has resigned as president, director and chairman of the board of Wellington Computer Systems Inc. of New York and all other positions within the company and its subsidiaries, including Telex Corp.

■ Engineering Computer Systems, Inc., Lexington, Mass., appointed Thomas J. Sorger to the post of executive vice-president.

■ Joel A. Kramer has been named vice-president, engineering, of Computer Entry Systems Corp., Silver Spring, Md.

■ William T. Bayer Jr. has been promoted to vice-president of technical operations of Honeywell Information Systems.

■ Courier Terminal Systems Inc. of Phoenix, Ariz., has appointed Edward F. Kearns as president.

■ Tracor Computing Corp., Austin, Texas, has appointed Joseph R. Parker vice-president, computing services. Warren A. Wasson has been named to the newly created position of vice-president, insurance service.

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Contracts

SYS Computer Corp., Hackensack, N.J., has signed a contract with Optical Scanning Corp. to adapt the SYS 1000 Micro-processor for use in an optical mark reading document scanner.

Computer Sciences Corp. has signed a contract with the Special Communications Project Office of the U.S. Naval Electronic Systems Command to provide technical support and management assistance in the command's communications effort. The contract is valued at \$1 million for the first year.

Princeton Electronic Products, Inc., N. Brunswick, N.J., has received a contract for \$670,000 from Smith, Kline Instruments Division of Smith, Kline & French, Inc. for electronic display equipment to be used in medical data processing systems.

Mohawk Data Sciences Corp., Herkimer, N.Y., has signed contracts, valued at \$2.4 million, with the World-Wide Communications Network of the Department of Defense for peripheral equipment.

Burroughs Corp. has received a \$469,000 research and development contract from the U.S. Air Force for the development of an advanced aerospace multiprocessing computer to be used in future high performance aircraft and space vehicles.

4551 Light Pen Unit Moves Video Cursor

BEAVERTON, Ore. — The 4551 Light Pen Unit from Tektronix, Inc. operates with CRT displays to generate a movable video cursor and corresponding X, Y position information. The location of the cursor is chosen with a hand held light pen.

Information may be written on CRT displays when using the 4551 with the Tektronix 4501 scan converter by placing the pen tip against the display CRT and moving it while depressing the "touch switch."

Analog and digital X, Y coordinate information directly corresponding to the pen's point position and movement is available.

Any area of the display selected with the light pen may be magnified up to five times when using the 4551 with the 4501 scan converter, the company said. The magnified and original non-magnified units can be presented as superimposed, alternating displays by using a mixed mode feature.

The 4551, at \$1,800 in the second quarter, is priced at \$1,800. The company's mailing address is Box 500.

Micro 400 General-Purpose Mini Has Software Support

SANTA ANA, Calif. — The Micro 400 from Microdata is a programmable, general-purpose machine provided with support software packages which include a symbolic assembler; teletypewriter operating system; tape editor; program loader; and processor and I/O diagnostics.

The unit has a multiregister organization for general-purpose controller applications, with a total of 173 instructions including bit manipulation, counting and control routines. Base register addressing is offered as an option.

The Micro 400 has a 1.6 μ sec cycle time, an 8-bit word length and 1K, 4K, or 8K words of core memory in the basic unit. It operates up to 32 I/O devices, can work without the control panel, and uses standard MSI and TTL integrated circuits.

Available from 644 E. Young St., the unit sells for \$3,250 in a 1K core configuration.

Instrument Modules Aid Interface

PRINCETON, N.J. — Two instrument modules that help eliminate interfacing problems between experimental and analytical equipment and computers are available from Princeton Applied Research Corp.

The Model 265 Programmable Differential Amplifier serves as an interface between an analog multiplexer or similar device and an A/D converter. It receives multiplexed data corresponding to the outputs of up to nine analog instruments, and provides a gain of 1, 10 or 100 as required to scale each output data segment to the optimum range for driving the A/D converter.

The unit has three operating modes; its gain can be programmed by setting front panel toggle switches; through the application of a BCD command; or it can automatically select the optimum gain. The price is \$775.

The Model 267 Logic Level Converter interfaces instruments with non-standard logic levels between -50 V and +50 V to equipment with standard DTL/TTL logic levels. The instrument converts up to 24 parallel data lines and six control lines in the forward direction, and up to six control lines in the reverse direction. It functions with either ground true or ground false logic and sells for \$525. Delivery for both units is 90 days. The mailing address is Box 656.

Badge Reader Checks I.D.s

MAMARONECK, N.Y. — Identification and information match required for such applications as medical instrument reading, process control, personnel identification and credit card verifications is pro-

vided by using 12 by 22 card reader for cut-corner badge sensing and a standard plastic I.D. badge available from Sealectro Corp.

New OEM Products

assured by remotely operated contacts which do not come into contact with the badge surfaces. The 488 gold-plated beryllium copper contacts are input busbed with individual leads to 244 output points, as standard.

Position-sensing switches can be wired to accommodate cut corners on the left or the right side of each badge being read. Programming Devices Division of Sealectro Corp. is at 225 Hoyt St.

Bowmar/Ali Offers Delay Equalizer

ACTION, Mass. — Bowmar/Ali, Inc. has announced the 471A Delay Equalizer

which includes three delay sections, each of which can be set at four different frequencies.

The unit can be used with the DAA. Other functions include: unity gain; half duplex or simplex operation; and no interaction between delay and amplitude characteristics.

GTE Sylvania Adds Two Monitors

SENECA FALLS, N.Y. — The Electronic Tube Division of GTE Sylvania Inc. has introduced two 12-in. monitor cathode ray tubes for information display applications. The tubes are models SC5595A, with approximately 29% light transmittance, and SC5595B with 48% light transmittance measured at the center of each tube.

The aluminumized screens provide 74 sq in. of viewable area and the tubes feature 90° magnetic deflection and gray filter glass face-plates. Further information may be obtained from 70 Empire Drive.



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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Nickels & Dimes

At the end of the latest round of Zenith Radio vs. Hazeltine Research things looked mighty sour for Hazeltine, indeed. Acting on one segment of a patent infringement suit and counterclaim that began in 1959, the Supreme Court ordered Hazeltine to pay Zenith \$19 million. The trouble damages stem from Hazeltine's participation in a patent pool that excluded Zenith.

\$\$\$

And speaking of \$19 million, that's just about what Fairchild Camera and Instrument lost in 1970. The company dropped \$4.40 a share on total sales of \$219 million. In 1969 the firm posted a profit of \$985,000, or 23 cents a share, on sales of \$251 million. The semiconductor division was unprofitable in the last three quarters of the year.

\$\$\$

While several American firms have approached bankrupt Rolls Royce Ltd. with offers to buy Rolls' stake in Systems International, SI wants to continue to remain in European hands. R.R. owns 40% of SI and its parent holding company, a total investment of about \$2.4 million. The service bureau time share firm is struggling to establish a Europe-wide DP network.

\$\$\$

Computing & Software has been cleared to file an application for listing on the New York Stock Exchange. CBS may go onto the Big Board this spring.

\$\$\$

Heir-apparent to Viatron in the programmable terminal business, Sycom reported a year-end loss of \$2.5 million, less than Viatron's, and slightly better than its own year-end performance. In 1970 sales and lease revenue exceeded \$2.5 million, up from \$798,000 in 1969, and unaudited figures indicate the full year loss will be somewhat less than last year's \$3.6 million. Third quarter loss was \$758,000.

Ampex Earnings Still Well Below '70

REDWOOD CITY, Calif. — Ampex Corp. sales were up slightly in the third quarter ended Jan. 30, 1971, compared with the year earlier quarter, but earnings continued well below last year. For the nine months, both sales and earnings were below last year's marks.

Sales for the third quarter were \$83 million, up from \$80.3 million a year earlier. Net earnings were \$1.4 million or

12 cents per share, compared with \$4 million or 37 cents.

Nine months sales were \$222 million, compared with \$230 million. Earnings totaled \$2.7 million or 25 cents a share on 10,874,406 average shares outstanding, compared with \$11.4 million or \$1.06 on 10,837,372 shares.

Some improvement was evident in both sales and product orders over the previous

quarter, according to William E. Roberts, board chairman.

"We have not as yet experienced a return to normal sales activity in several of our capital equipment product areas," Roberts said. "Shipments of computer peripheral equipment for end-users continues to grow dramatically. Most of this is lease business that will provide both revenues and earnings in future reporting periods due to conservative accounting treatment utilized by the company."

"It is clear that our year-end earnings will be well below last year, but we expect a stronger recovery trend in our next fiscal year."

Vancouver Gets Quote System

VANCOUVER, B.C. — The Vancouver Stock Exchange, one of three securities exchanges in Canada, has interfaced a Digital Equipment of Canada, Ltd., PDP-8/i-based communications system to

brokers to obtain quotation information via Teletype equipment in their offices, rather than relying on telephones or the ticker tape to which each brokerage firm subscribes.

Requests for quotation information are handled by the DEC system in the IQS. A broker types the ticker symbol he desires, and the computer responds with the bid and ask price, total volume traded, opening price, high, low, last price, and net change from the previous day.

This information is available for the 350 stocks listed on the exchange, as well as the 150 in an "interim" category.

In normal operations, two brokers on the exchange floor trade stock and note the transaction on paper. Details of the transaction are entered into the PDP-8/i.

Financial

a Univac 9300 to provide brokers throughout the country with quotation information.

The DEC's system also clear all trades and summarize daily trading activities.

The DEC's system, built around a PDP-8/i computer, serves as a message concentrator in the exchange's Instant Quotation Service (IQS) that allows

Eeco Revises Year-End Report

SANTA ANA, Calif. — Year-end operating results previously released by Electronic Engineering Co. of California (Eeco) have been revised to include an additional provision of \$457,000 to reduce the carrying values of investments.

As revised, the net loss for the year ended Dec. 31, 1970 is \$1.1 million or \$1.81 per share. Extraordinary items of \$457,000 and \$396,000 are included in this loss.

The \$457,000 extraordinary charge is in line with a policy of providing a reserve to reduce the carrying value of the investment in and advances to Dimetric, Inc. to an amount equal to the company's

equity in the net assets of Dimetric, Inc. The \$396,000 extraordinary charge is to establish a reserve to reflect the difference in the market quotation and the cost of the 50,000 shares of Newell Industries, Inc. stock held by Eeco.

The operating loss, before deducting the extraordinary items, was \$369,000 or 59 cents per share.

Interdata Revenues Rise, Earnings Fall

OCEANPORT, N.J. — Minimizing Interdata Inc. has turned in year-end figures that show a healthy rise in sales but a precipitous drop in profits.

In 1970 revenues reached \$65.6 million, well up from \$5.6 million in 1969. Net income, though, fell to \$43,353, off from \$257,695. On a per share basis, 1970's profits amounted to two cents, while 1969's were 16 cents.

"We were pleased by a number of trends that materialized during the year," commented Daniel Sinnott, board chairman. "For one, the sales we were able to generate in this difficult economic climate reflects the success in our marketing efforts — especially in our international operation."

"The year further saw us expand in the fast growing data communications marketplace," Sinnott added. "This will be an increasingly important area for Interdata's future growth."

Computerworld Sales Offices

Vice President — Sales

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Sales Administrator:
Dorothy Travis
COMPUTERWORLD
797 Washington Street
Newton, Mass. 02160
(617) 332-5606

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Los Angeles Area:

Bob Byrne
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& Associates
1541 Westwood Blvd.
Los Angeles, Calif. 90024
213/477-4208

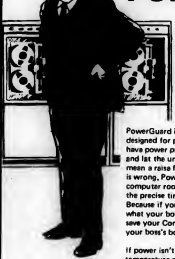
San Francisco Area:

Bill Healey
Thompson/Healey Assoc.
1111 Hearst Bldg.
San Francisco, Calif. 94103
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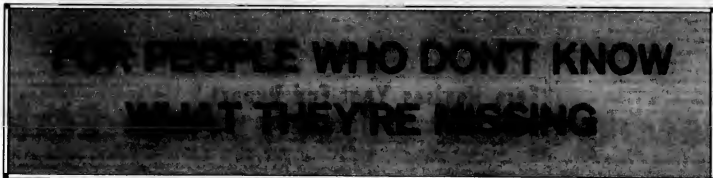
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Group I New Products and Applications

The data offered in these Reports and Profiles describe new products being offered to and by the data processing industry. Included are applications for these products as well as new applications for existing products. Reports include names of suppliers; users who have developed new applications for products; new general developments in the field.



(Circle No. on coupon)

- 1 Computers & Minicomputers
- 2 Terminals
- 3 Software
- 4 Components
- 5 Supplies
- 6 Services

Group II Installation Contracts

This Profile deals with the granting of data-processing contracts. Included are contracts for hardware, software, and peripherals. The information reported includes, whenever available, the names of the companies involved in the contract; a statement of the proposed work; the length of the contract; its proposed start-up date, etc. (Circle No. 7)



Group III Industry News

(Circle No. on coupon)

- 8 Mergers & Acquisitions
- 9 New Companies & Services
- 10 Marketing Trends & Forecasts

Group IV User-Markets: Developments and Applications

Data-processing developments and applications for specific markets and uses of available products (hardware, software, services, etc.) are highlighted in these Reports and Profiles. Included are data detailing how the product is used for specific jobs; its value to specific user-markets; users of the product; companies offering the product; availability of the product; components of packages for user-markets.



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- 11 Accounting
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- 21 Education
- 22 Law Enforcement
- 23 Legal
- 24 Government

Group V Reports and Profiles for Specific Job Titles

These Reports and Profiles contain data of interest to people with specific responsibilities in the field of EDP. They deal with developments in data-processing which have a direct bearing on the type of work performed in these positions.

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- 26 Programmers
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- 29 Librarians
- 30 Corporate Executives (including MIS data)

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Computerworld Stock Trading Summary

CLOSING PRICES THURSDAY, MARCH 4, 1971

PRICE						PRICE					
E N	R A N G E	1870-71 C L O S E	C H A N G E	N E E R	P R I C E	E N	R A N G E	1870-71 C L O S E	C H A N G E	N E E R	P R I C E
SOFTWARE & EDP SERVICES											
A	ADVANCE COMP TECH	1-10	2 5/8	-1/8	-4.5	O	ROORE BUS. FORMS	25-38	37 3/4	0	0.0
A	APPLIED DATA RES.	4-24	12 5/8	-3/8	-12.8	O	REYNOLDS & REYNOLDS	21-43	34 5/8	-1 3/4	-15.0
A	APPLIED LOGIC	1-18	3 1/4	0	0.0	O	STANDARD REGISTER	17-30	21 1/4	+3/8	+1.0
A	ARIES	1-8	1 7/8	0	0.0	O	TAB PRODUCTS CO.	4-12	11 3/4	0	0.0
A	AUTOMATIC DATA PROC	23-34	53 3/4	+1 1/4	+10.1	N	UARGO	7-30	8 1/8	-1/8	-1.0
A	AUTO SCIENCES	3-14	6 1/4	-1 1/4	-15.0	A	WAGASH MAGNETICS	7-30	8 1/8	-1/8	-1.0
O	ORAMON APPLIED SYS	1-10	1 1/2	-1/4	-33.3	R	MALLACE BUS FORMS	17-41	19 7/8	+1/2	+2.1
O	COMPUTER AGE INDUS.	1-3	3 3/4	0	0.0	COMPUTER SYSTEMS					
O	COMPUTER ENVIRON	1-15	1 1/4	0	0.0	N	BURNHANS GROUP	74-173	111	+2 1/4	+24.0
O	COMPUTER INDUS.	2-24	3	0	0.0	R	COLLINS RADIO	37-57	37	3/4	+6.0
O	COMPUTER NETWORK	2-16	6	0	0.0	R	CONTROL DATA CORP.	30-122	58 1/2	+1 1/2	+6.0
O	COMPUTER PROPERTY	4-15	3 3/4	-1/4	-5.0	R	DATA GENERAL CORP.	14-58	51 5/8	+5/8	+4.0
R	COMPUTER SCIENCES	8-34	11 7/8	-1/8	-1.0	R	ORIGINAL EQUIPMENT	30-124	71 1/4	+3/4	+6.0
R	COMPUTER TASK GROUP	1-4	3 1/4	0	0.0	N	ELECTRONIC ASSOC.	3-11	7 1/8	+3/8	+1.0
O	COMPUTER USE	1-13	12 1/2	+1/2	+12.5	A	ELECTRONIC ENGINEER.	3-14	7 1/8	+1/8	+1.0
O	COMP AUTOMAT REPORTS	3-13	0 1/2	+1/8	+1.8	O	GENERAL AUTOMATION	8-42	21 1/2	+2/8	+15.1
O	COMPTON & SOFTWARE	18-37	37 3/4	+3/8	+13.2	N	GENERAL ELECTRIC	100-100	100	1 1/4	+1.0
O	COMRESS	1-10	2 1/4	-1/8	-4.3	R	HEWLETT-PACKARD CO.	18-45	37 3/8	+1 1/2	+1.0
O	COMSHARE	2-13	5 1/8	-1/8	-2.0	R	HOWELL INC.	95-152	95 3/4	+1/4	+0.0
O	CONSOL. ANAL. CENT.	1-4	3 1/8	-1/8	-3.0	I	ION	223-287	340 3/4	+3/4	+20.0
O	CORP. DATA	1-16	3 3/4	-1/4	-5.0	O	INTERDATA INC	1-12	3 1/4	+1	+15.0
O	DATA PACKAGING	5-18	8 3/8	-1/4	-4.5	N	RCR	30-40	40	5/8	+1.5
O	DATAMATION SERVICE	1-8	1 1/2	0	0.0	N	REGA	14-14	12 1/2	+1/4	+5.0
O	DATATAP	4-28	27 1/4	+1 1/2	+13.0	R	RAYTHEON CO.	10-17	33 3/8	+3/8	+1.5
O	DIGITEK	1-5	2	-3/4	-11.1	O	SCI. CONTROL CORP.	3-8	1 1/4	+1/8	+1.0
O	EDP RESOURCES	5-13	8	-3/8	-4.0	R	SPERRY RAND	18-40	33 1/4	+1 3/8	+4.5
O	ELECT COM PROG	1-15	3 1/4	0	0.0	R	SYSTEMS ENG. LABS	8-25	18 1/2	+1 5/8	+11.3
O	ELECTRONIC DATA SYS.	51-101	82	+15	+19.8	R	VARIAN ASSOCIATES	8-28	19 3/4	+1 1/2	+5.0
O	INFORMATICS	4-21	8 3/4	-1/4	-5.5	R	WARD LABS.	8-28	19 3/4	+1 1/2	+5.0
O	TEL	8-28	27 1/4	+1 1/2	+13.0	R	XEROX CORP.	80-115	87	+2	+1.0
MANAGEMENT DATA											
N	MANAGEMENT DATA	7-25	6 5/8	-3/8	-5.5	O	BOOTHE COMPUTER	8-25	18	+1	+5.0
N	NATIONAL CSS INC	4-18	11 1/2	+1/2	+5.2	O	BRESHAN CORP.	2-9	9 3/4	0	0.0
N	RAT COM ANALYSIS	2-12	1 1/2	-3/8	-16.0	A	COMPUTER EXCHANGE	2-8	1 1/8	+1/4	+6.0
N	RAT. COMP. SERV.	2-12	1 1/2	-3/8	-16.0	A	COMPUTER INVESTORS ORP	12-12	11 7/8	+1/4	+5.0
N	PLANNING RESEARCH	13-24	21 1/2	-1/4	-1.1	O	DATA PROC. & G	0-32	15 7/8	+1 3/8	+14.0
N	PROGRAMMING METHODS	2-18	2 1/2	-1/8	-3.7	O	DYNAMIC RECORDING	1-1	1	0	0.0
O	PROGRAMMING & SYS	2-5	3 1/8	-1/2	-18.0	A	DIARDOR COMPUTER	10-11	50 3/4	+1 1/2	+4.0
O	PROGRAMMING SCIENCES	1-35	1 1/2	-3/8	-30.0	O	DIEROLD COMP. LEAS.	2-8	8 1/4	+3/8	+5.0
O	QUANTITATIVE RESOURCES	1-12	1 1/2	-3/8	-30.0	A	EPS, INC.	7-10	5 7/8	+5/8	+5.0
O	SYSTEMS	1-12	1 1/2	-3/8	-30.0	A	GRANITE MGT	7-22	11 3/4	+1/4	+1.0
O	TOS COMPUTER CENTERS	4-27	8	0	0.0	A	GREYHOUND COMPUTER	5-14	14	1/2	+5.0
O	TOLLEY INTL. CORP.	3-13	3 1/8	-1/4	-5.0	R	LEASCO DATA PROC.	7-30	20 3/8	+1 1/8	+6.0
UNIVERSITY COMPUTER											
N	UNIVERSITY COMPUTER	14-28	25 3/8	-1/8	-1.7	O	LECTRO MGT INC	1-8	2 1/2	-1/4	-4.7
UPS	SYSTEMS	5-21	8 3/4	-3/8	-8.8	A	LEVINTOWNSEND CMP	1-18	8	+1/2	+5.0
O	U.S. TIME SHARING	3-18	3 1/4	0	0.0	O	LOCKHEED CORP.	1-8	5 7/8	+1/8	+15.0
PERIPHERALS & SUBSYSTEMS											
N	ADDRESSOGRAPH-MULT	28-82	32 5/8	+1 1/4	+7.4	O	ROCC INDUSTRIES	1-8	5 7/8	+1/8	+15.0
N	PHARMACINE	2-13	3 1/8	-1/4	-4.8	O	SYSTEMS CAPITAL	1-8	4 1/2	+3/8	+7.0
N	AMPER CORP.	13-18	19 7/8	+5/8	+5.2	E	W. LEASING	1-8	4 1/2	+3/8	+7.0
O	ASTRODATA	1-34	1 5/8	0	0.0	ECON: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE L=LATVONAL EXCHANGE; O=OVER-THE-COUNTER					
O	ATLANTIC TECHNOLOGY	1-18	1 1/2	-3/8	-15.0	O-T=C=FOREIGN ARE BID PRICES AS OF 3 P.M. OR LAST BID 11 AT NEAREST DOLLAR					
A	BOLT, BERANEK & MEN	5-11	7 1/2	+1/4	+5.0	Computer Stocks Trading Index					
N	BUNKER-RAND	6-14	12 5/8	+5/8	+5.3	----- Computer Systems					
N	CALCOMP	11-24	27 7/8	+2	+17.7	----- Software & EDP Services					
O	CONTECHNICS	5-15	8 1/2	-1/4	-4.8	----- Peripherals & Subsystems					
O	COLORADO INSTRUMENTS	4-12	5 1/2	-3/8	-9.0	----- Leasing Companies					
O	COMPUTER COMMUN.	5-18	15	+1 1/8	+18.8	----- Supplies & Accessories					
A	COMPUTER EQUIPMENT	4-12	5 1/4	0	0.0	----- C/W Composite Index					
A	COMPUSET	12-24	18	+3/8	+2.1						
O	CORSEL COMPUTER LTO.	4-14	10 1/2	-1/4	-5.3						
A	DATA PRODUCTS CORP.	2-13	3 1/4	-1/8	-3.8						
A	DATA TECHNOLOGY	2-23	5 3/4	0	0.0						
O	ELECTRONICS	5-15	8 1/4	-1/2	-12.0						
N	ELECTRONIC M & M	7-40	11 1/4	0	0.0						
O	FARBIT-TEK	2-8	2 7/8	0	0.0						
O	FARRINGTON MFG	1-17	1 5/8	+3/8	+6.5						
O	FOTO-MAGNET INC	1-15	4 1/2	-3/8	-8.8						
O	INFOREX INC	18-39	31 1/2	-1	-3.0						
O	INFORMATION DISPLAYS	4-20	14	-1/2	-7.0						
O	KEYDATA CORP.	7-14	11 3/4	-3/8	-5.0						
O	MANAGEMENT ASSIST	1-4	1	+3/8	+14.2						
N	MARSHALL INDUSTRIES	14-27	22	+1 3/4	+21.5						
A	MILRO ELECTRONICS	13-42	19	+1	+8.0						
R	MORANE DATA SCI	19-37	35	+5	+10.0						
O	OM LINE SYSTEMS INC	6-23	11	-1/2	-5.0						
O	OPTICAL SCANNING	11-52	18 1/2	-1/4	-1.4						
O	PHOTON	4-17	10 1/8	0	0.0						
O	PHOTO-MAGNETIC SYS.	1-3	1 1/4	+3/8	+21.4						
A	POTTER INSTRUMENT	15-42	3 1/2	-1/4	-4.8						
O	PRECISION INST.	8-23	10 1/2	-3/8	-9.0						
O	RECOGNITION EQUIP	12-31	21	-1/2	-7.0						
O	RECONOR CORP.	4-14	8 5/8	0	0.0						
N	SANDERS ASSOCIATES	7-28	18 5/8	+1 1/4	+7.1						
O	SCAM DATA	5-23	7 3/8	+1/2	+6.5						
O	TALLY CORP.	10-23	11 1/2	+1/8	+0.9						
N	TELER	10-23	11 3/8	+2 3/8	+13.0						
O	VIATRON	1-15	1 1/4	-3/8	-30.0						
SUPPLIES & ACCESSORIES											
N	ADAMS-MILLIS CORP	8-18	18 5/8	+1 1/8	+6.0						
O	BALTIMORE BUS FORMS	6-21	8	-1/2	-5.2						
A	BARRY HIGHT	10-23	11 1/2	+1/8	+0.9						
A	DATA DOCUMENTS	13-35	28 7/8	-3/4	-2.7						
N	ENNIS BUS FORMS	6-23	8 3/4	+1/4	+5.5						
O	GRAMM MAGNETICS	4-18	13 3/4	0	0.0						
O	GRAPHIC CONTROLS	5-17	8	0	0.0						
N	HENRICH	18-186	83 3/4	+8	+10.3						
N	KSA COMPANY	73-114	104 3/4	+1 7/8	+1.8						

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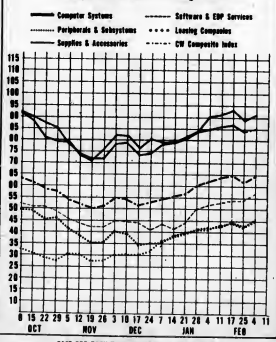
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Earnings Reports

ELECTRONIC DATA SYSTEMS			
Three Months Ended Dec 31	1970	1969	
Shr Earnings	\$2.13	\$2.13	
Revenue	18,668,825	10,084,813	
Earnings	2,514,887	1,505,082	
Revenue	34,466,307	17,287,471	
Earnings	4,433,239	2,510,607	
HAZELTINE CORP.			
Year Ended Dec 31	1970	1969	
Shr Earnings	\$9.53	\$8.17	
Revenue	1,027,879	767,088	
Earnings	1,027,879	767,088	
DATA DOCUMENTS INC.			
Three Months Ended Dec 31	1970	1969	
Shr Earnings	\$2.58	\$2.58	
Revenue	6,277,170	5,904,795	
Earnings	1,311,013	212,874	
STANDARD REGISTER CO.			
Year Ended Jan 31	1971	1970	
Shr Earnings	\$2.28	\$2.28	
Revenue	103,165,464	103,622,182	
Earnings	3,912,460	4,401,988	
Revenue	25,836,424	27,838,410	
Earnings	1,108,301	1,430,023	
NATIONAL CASH REGISTER			
Year Ended Dec 31	1970	1969	
Shr Earnings	\$1.37	\$1.37	
Revenue	1,420,576	1,264,942	
Earnings	1,420,576	1,264,942	
METRODATA COMPUTING INC.			
Year Ended Dec 31	1970	1969	
Shr Earnings	\$1.62	\$1.62	
Revenue	1,624,455	892,161	
Earnings	1,624,455	892,161	
PITNEY-BOWES INC.			
Year Ended Dec 31	1970	1969	
Shr Earnings	\$1.62	\$1.62	
Revenue	1,624,455	892,161	
Earnings	1,624,455	892,161	
RECONOR CORP.			
Shr Earnings	\$2.13	\$2.13	
Revenue	278,201,000	251,477,000	
Earnings	12,538,000	12,538,000	
Revenue	78,040,000	78,040,000	
Earnings	1,791,000	6,783,000	
MOORE CORP. LTD.			
Year Ended Dec 31	1970	1969	
Shr Earnings	\$1.12	\$1.12	
Revenue	431,841,000	398,831,000	
Earnings	37,211,000	35,172,000	
AMERICAN USED COMPUTER CORP.			
Year Ended Dec 31	1970	1969	
Shr Earnings	\$54.00	\$54.00	
Revenue	332,779,925	685,085,232	

Computer Stocks Trading Index



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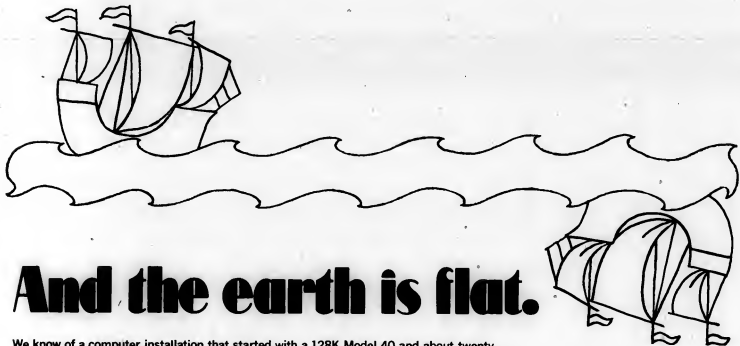
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But then they added ten more terminals and went right back to thirty-second response time.

Spending another \$3300 a month for a Model 50 didn't help either. They had to add *still* more core to restore response time—but after adding another ten terminals, they were back in the soup again.

There's a solution to this paradox but it doesn't come from IBM. It's called ENVIRON/1—a real-time system that makes a /360 respond in a few seconds *regardless of the model or the number of terminals.*

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